

FORMING A COMPLETE RECORD OF THE PROCEEDINGS OF ALL PUBLIC COMPANIES.

[PRICE 6D.]

By order,
Broad-street-buildings, London, March 11, 1850.

Transactions of Scientific Bodies.

MEETINGS DURING THE ENSUING WEEK.

THIS DAY	Royal Botanic—Inner Circle, Regent's Park	3 P.M.
MONDAY	Geographical—3, Waterloo-place	7 P.M.
	Medical—3, Bolt-court, Fleet-street	8 P.M.
TUESDAY	Medical and Chirurgical—53, Berners-street	8 P.M.
	Zoological—11, Hanover-square	8 P.M.
	Civil Engineers—25, Great George-street	8 P.M.
WEDNESDAY	Society of Arts—Adelphi	8 P.M.
	Geological—Somerset House	8 P.M.
THURSDAY	Royal Society of Literature—4, St. Martin's-place	4 P.M.
	Numismatic—41, Tavistock-street, Covent-garden	3 P.M.
SATURDAY	Chemical—149, Strand	8 P.M.
	Westminster Medical—17, Saville-row	8 P.M.

GEOLOGICAL SOCIETY.

MARCH 13.—Sir R. I. MURCHISON (Vice-president) in the chair.

In our last Number we inserted a paper by Mr. EVAN HOPKINS, on the Structure of the Crystalline Rocks of the Andes, deferring the discussion until our present Number. After a few observations from the vice-president (Sir R. I. Murchison), eulogising in the highest terms the elaborate and beautiful sections before him, the first of the kind he had ever seen introduced into the society, the discussion commenced.

Mr. SHARPE said, that the questions brought forward that evening were of such great importance and magnitude, and the mass of facts displayed in the sections were indeed so overwhelming, that he scarcely knew how to begin. He regretted that the paper was so short, and out of proportion to the magnitude of the subject. He would, however, endeavour to point out a few facts from observations he had made in Scotland; and by reference to several authorities, which would fully corroborate Mr. Hopkins's description of the uniformity of the structure, or planes of cleavage, and the transitions of the crystalline rocks, and their being differently situated in the series to that generally represented in ideal sections. The question, whether such order and transitions were due to crystallising action, or not, he was not prepared to enter into; but it was very evident some power analogous to it was the cause; and for the want of a better term, he would call it crystallising action. However startling Mr. Hopkins's papers, sections, and views, might be to the members, they were not so to him; and he said that they must be prepared to modify their ideas very considerably with respect to the primary rocks. Mr. Sharpe entered into a variety of further detail, in corroboration of the questions at issue.

Professor RAMSAY said, that he could not agree with the views of Mr. Hopkins; he pointed out instances which he thought would prove that they could not be maintained. For instance, fossil beds being converted into quartzose rock, by being in contact with granite, &c., showed, he thought, that instead of granite being converted into slaty rock, the contrary effect took place. This change he considered was produced by the melted granite when in a state of lava beneath the sea; and he concluded by a few elucidations in support of his views, according to the Huttonian theory.

Mr. SHARPE begged leave again to make a few remarks on Prof. Ramsay's observations; it appeared to him that Mr. Ramsay did not exactly comprehend the question at issue, or at least had not entered into it. Mr. Hopkins, he said, did not dispute that the crystalline base changes the character of the sedimentary beds; on the contrary, he pointedly alludes to such changes—in fact, it being one of his principal arguments, and illustrated in many parts of his sections. Mr. Sharpe then described the nature of the change of the crystalline base below, into the schistose structure above, showing how the crystals of the base became gradually arranged into parallel lines, as described in the paper, being a totally different effect to that pointed out by Prof. Ramsay.

Mr. NICOL made a few observations; he thought the changes of the granite into the slate could easily be accounted for, by supposing an action to be put in force, something similar to a furnace below melting the granite, during the boiling of the igneous matter, the metamorphic slate rocks alluded to would, he thought, be produced.

Mr. DUMARÉZ, although he had not the honour of being a member, hoped he should be allowed to make a few observations on the subject of the paper. He stated, that he had assisted Mr. Hopkins in making some of his barometrical observations during his last survey on the River Magdalena. The beautiful sections before them appeared to him as natural as the scenes themselves, especially that part of the valley of the Magdalena where he had been engaged. The cleavage planes, their direction, angular position, and the transition of the crystalline rocks, he (Mr. Dumaré) had had the opportunity of studying for some years, both underground and on surface, at the Santa Ana Silver Mines, which were for some time under his charge, and stated, that they were exactly as represented by Mr. Hopkins—viz.: running uniformly at an angle of a few degrees east of north, and on that side of the chain, slightly leaning from the perpendicular towards the east. Since his return to Europe, he had been in many parts of Germany, and found that the bearing of the cleavage planes were in conformity to those observed on the Andes, and alluded, in particular, to the fine natural sections on the banks of the Moselle, where this phenomenon is beautifully exhibited.

No other member coming forward, the president requested Mr. HOPKINS to make his reply; who, after thanking the president for the very complimentary manner in which he had eulogised his sections and labours, said, that he was truly happy to find such an excellent observer as Mr. Sharpe, and who is such an active member in the investigation of the phenomenon of cleavage planes, giving his able support, and substantiating the substance of the paper just read; indeed, he (Mr. Sharpe) had made up for the deficiency in the details of the paper, which he admitted was shorter than the subject justified. Mr. Hopkins, however, stated this must be considered merely as the commencement of the subject. The only opponent being apparently Prof. Ramsay, he (Mr. Hopkins) would confine himself in replying to the observations made by that gentleman. The alterations of a sedimentary bed, in contact with granite, was well understood, but that kind of change, and the arguments brought forward were quite irrelevant, and totally distinct to that of the fibrous laminated and elongated changes of the crystalline base in the direction of the grain into a schistose structure. It was well known that the mere contact of two rocks will cause a saturation of the elements of one into those of the other. For instance, a calcareous bed deposited on a silicious rock, would, in the course of time, be changed near the junction into a silicate of lime. Suppose a sandstone was placed on a salt rock, the natural consequence would be, its conversion, in the course of a short time, into a siliferous sandstone, and such is the case with all other rocks, arising from the moist nature and constant chemical action going on below. The primary rocks *in situ* are never found dry and hot, they are always found moist, and frequently super-saturated with an alkali, capable of dissolving all the materials. He would not detain the society on that occasion, by dwelling on the great and sublime order displayed in the material, as well as the organic kingdom, which could only be produced by such laws of harmony, as we now find governing the whole surface; but he would endeavour to impress on them, for the sake of that science which it was their object to promote, the necessity of studying the real structure of the crystalline rocks, and *in situ*, so as to see the great order which prevailed in the mineral kingdom. To set aside pre-conceived notions, however cherished by old attachments, when fairly found of no avail and incompatible, so as to remove some of those obstructions which now stood on the road to usefulness and truth. He had confined himself, on that occasion, to the description of the actual character of the rocky base, and the actions seen within, proved by daily observations. Mr. Hopkins stated, that the object of bringing this paper before the society was not with a view of inducing others to adopt his ideas, but he would state that, unless these physical questions were entered into, the progress of geological science would be greatly retarded. As regarded himself, Mr. Hopkins briefly stated that he could not fulfil and follow up his professional engagements without the aid of those principles he had long ago promulgated, successfully applied, and published to the world. The mining capitalists and the practical miner had, as yet, no other guide from the geologists to assist them in their subterranean works; therefore, for the sake of the science of geology, as well as for the sake of truth and usefulness, let this subject be thoroughly entered into. He was well prepared for every question connected with the subject, as his researches were not alone confined to geology, but embraced also internal temperature, chemical, magnetical, and astronomical observations, and other questions connected with terrestrial physics, and were carried on with the best instruments; he, therefore, trusted that the result of this inquiry would be the removal of a great part of the existing errors and incorrect views, and produce a new impulse in the march of this science towards that elevated position which it will one day occupy in terrestrial physics.

The sections, two of which were each 16 ft. long, and most elaborately finished and coloured, to exhibit the alterations of the various crystalline bands, caused great interest; the paper was received with much satisfaction, and the discussion, we are happy to say, was carried on in a true philosophical spirit, and the president delivered his observations with an impartiality, worthy of the chair he occupied. Connected, as our Journal is, with geology and mining, and thus having our attention necessarily directed to the interesting and important truths connected with those sciences, we do not hesitate to express our opinion, that the arguments brought forward by Mr. Hopkins were sufficiently convincing with respect to the moist chemical action going on in the rocks, and causing the changes which we observe continually taking place in such beautiful order. We can by no means agree with those who support the igneous theory—not only from the fact that all our deep mines are watery, and never dry heat, but as a hypothesis even, it is truly one by far too crude and irregular in its supposed operations to support the beautiful order which presents itself to our view, in respect at whatever point we may the wonders of the mineral kingdom.

INSTITUTION OF CIVIL ENGINEERS.

MARCH 19.—WILLIAM CORRIE, Esq. (President), in the Chair.

The discussion on Mr. Fairbairn's paper, "On Tubular Girder Bridges," was resumed, and continued through the evening. The subject was resumed at the point where it was left on the last discussion of March 12; and Messrs. Wild, Pole, Rennie, Scott Russell, Eaton Hodgkinson, Walker, Glynn, Bidder, Prof. Willis, General Pasley, and Captain Simmons, R.E., examined the question at great length, and under all views, illustrating their position by diagrams and models, used in the experiments and in the mathematical investigations. It was stated that, after the remarks made at the last meeting, it was merely requisite to describe the experiments alluded to, and before doing so, to briefly describe their object.

In the Report of the Government Inspector, the limiting strain required for the public safety was defined, and the Torksey-bridge had been condemned for not complying with those conditions. A calculation, therefore, had been made to ascertain the actual strain on the bridge. It appeared, however, that it was actually less than the limit prescribed by the Government Inspector. The experiments instituted were for the purpose of testing these contrary results. It was also stated, that in the paper there were many objectionable points, but particularly one that was positively dangerous.

The author had not only omitted the effect of the continuity of the Torksey girders, but stated that it was safer to do so. Now all writers upon the subject, and all who had considered the matter, agreed that in a continuous beam the effect of continuity was most important, and that in a perfectly continuous beam, the strain over the supports was even greater than elsewhere. It was, therefore, submitted that this was not the part, the consideration of which it could be "safer to omit."

The form taken by a continuous beam, when uniformly loaded, was convex over the supports, and concave between the points at which the convexity ended; at these points of contrary flexure, the horizontal strains were null, and the beam might then be severed, without altering its condition. The virtual length of the beam, in the Torksey-bridge, was determined by the distance between the exterior support and the point of contrary flexure; and it was to determine this point practically that the experiments were instituted. It was shown that this point was 21½ feet from the centre support, and that hence the length of the beam was reduced from 180 feet to 108½ feet.

The compressive strain upon a girder of this length, loaded as prescribed, was 4½ tons per inch, being less than the limit defined. Consequently, it was asserted that the railway company to whom this bridge belonged, had been deprived of its use, not in consequence of any omission on the part of their engineer, but in consequence of the inability of the Government authorities to appreciate the strength that had been provided.

In reference to the application of formulae to the calculation of the strength of the girders, it was considered desirable, in such an important case, not merely to form a general approximate notion of the strength of the bridge, but to ascertain, with all possible exactness, the nature and amount of the strains to which the structure was exposed; and this could only be done by using a comprehensive process of calculation, which should embrace all the elements affecting the strength of the bridge.

The effect of the continuity of the girders over the two openings, was carefully considered, and the nature of its effect upon the strain was explained, as deduced from the application of the most modern mathematical investigations, and it was demonstrated that the strength of the beam was thereby augmented above one-third. It was then shown, how the rules for estimating the strength of elastic beams, were rendered applicable to the case of the Torksey-bridge, and the results proved, that when the bridge was weighted with the load prescribed by the Government authorities as a test for its strength, the strains of compression and extension were only one-half of what competent authorities had stated might be safely applied.

The diagrams exhibited showed the results of mathematical calculation, as applied to the Torksey-bridge girders, and the remarkable coincidence of these, with experimental results obtained by other investigators in an entirely different manner, was insisted on, as a proof of the correctness of the conclusion arrived at. It was stated, in reply to a remark upon the increased deflection due to velocity, that the result of the experiments tried by the "Cast-Iron Bridge Commission," proved that "this increase was wholly insignificant in beams of the length and stiffness of those of the Torksey-bridge."

The discussion was summed up by it being stated that, with one exception, all those who had spoken during both evenings, agreed that the formula given in the paper was empirical, and not trustworthy; that the effects of percussion and increased velocity were practically only shadowy visions; and as it was admitted that, in the calculations of the Government Inspector, the effect of continuity was neglected, and as it had been proved that the strain was less on the bridge than that assigned as requisite for the public safety, and that it was, in fact, amply strong, it was evident that the public had been wrongfully deprived of the use of this bridge, and the company had been prohibited from gaining the just return for the capital invested, in consequence of an incomplete investigation, and the assumption of untenable formulae.

The papers announced to be read at the meeting of Tuesday, March 26, were "Description of the Chapple Viaduct, on the Colchester and Stour Valley Extension of the Eastern Counties Railway," by Mr. Peter Bruff, Assoc. Inst. C.E.; and "On the Manufacture of Iron, with Experiments on the Strength of Railway Axles," by Mr. G. B. Thorneycroft, Assoc. Inst. C.E.

OPENING FOR TRAFFIC OF THE BRITANNIA BRIDGE.—On Friday and Saturday, Captain Simmons, the Government Inspector for the Railway Commissioners, made his official inspection of this great structure, accompanied by Mr. Edwin Clarke, the resident engineer, and Mr. Hedworth Lee, the engineering manager of the Chester and Holyhead line, when a series of important experiments took place to ascertain the law of deflection, and the absolute structural strength of the fabric. The experiments consisted in observing the deflections under a series of successive loads; the passing of three locomotives, with a train sufficient to cover each of the tubes, through the bridge, at various speeds, and the running of locomotives and tenders through, without trains, at variable rates of progress. The first experimental Government train was a heavily laden one of coal waggons, weighing 240 tons, with three locomotive engines. This was run through the tube at the ordinary rate at which such trains travel, from 10 to 12 miles an hour, and the deflection, as taken by a deflectorometer, fixed in the centre tower, was scarcely perceptible. This train was then drawn completely over one of the tubes, and there left as a dead weight, while Captain Simmons descended and made a minute inspection of the masonry, the rivetting, plate-work, cellular top and bottom of the tubes, and other arrangements, which occupied a considerable time. On returning to the tube, the deflection caused by the load was found to be about three-fourths of an inch. Similar experiments made in the other tubes exemplified the perfect success that has attended the continuity of the beam—the most remarkable feature in the structure, caused by the junction of each of the before isolated tubes, for as the engines entered upon the small land tube the motion due to their progressive weight was ascertainable in every tube, even over to the further extremity of 1560 ft. in length. Locomotives in steam were then passed through as fast as practicable, but only at 20 miles an hour, owing to the curves at either end. The deflection was the fraction of an inch, and the vibration scarcely perceptible. The tonnage weight of the tube itself acting in reality as a counterpoise or preventive to vibration. Captain Simmons was understood to be extremely interested with the bold design and immense strength of the remarkable high road, now described by its engineers as strong enough to support a line of battle ship suspended, or a load of locomotives piled one on the top of the other over its whole surface. The experiments were considered as satisfactory, as tending to show that all parts of the great machine were obeying the calculated requirements, and as to a certain extent determining the conjectural question of duration and stability arising under the test of everyday usage. On Monday, the up express from Holyhead, carrying the mails and passengers from Ireland, came by the tube at a saving of a full hour over the usual transit. The subsequent trains two and fro also went through both ways. All the arrangements for this purpose are now permanently complete, and the floating of the twin tubes for the parallel line is occupying the attention of the engineers.

DISPUTED CONTRACT FOR IRON FOR THE BRITANNIA BRIDGE.—At the Oxford-Circuit, on Saturday, a cause was tried (Williams v. the Chester and Holyhead Railway Company) which related to a contract for supplying boiler plates and angle iron for the construction of the Conway and Britannia tubular bridges. The plaintiff, the proprietor of the Albion Iron-Works, at West Bromwich, contended that the contract, which was entered into partly in November, 1846, and partly in April, 1848, was for 2000 tons of boiler plates, and as much angle iron besides as the defendants would want for fixing the boiler plates. The defendants contended that the contract was for 2000 tons of iron, including both boiler plates and angle iron, and this question, which was of great pecuniary interest to the parties, in consequence of the fall in the price of iron since the contract was entered into, depended altogether on documentary evidence, and was, in fact, a question of law for the court on the construction of the documents, rather than a question of fact for the consideration of the jury, and ultimately the facts were turned into a special case for the opinion of the Court of Exchequer.

A TUMOUR IN THE NECK CURED BY HOLLOWAY'S OINTMENT AND PILLS.—Thomas Marlow, residing on the Welsh Back, Bristol, had been in ill health for years, and always complained of a soreness in his neck; he was seen by several medical gentlemen, but none were successful in affording him the least relief; however, after some time, a large tumour formed under his left ear, from which he suffered intensely, and tried remedy after remedy, without obtaining any benefit, until he made use of Holloway's Ointment and Pills, and these wonderful medicines soon reduced the tumour, and effectually cured it, and he is now in the enjoyment of the most robust health.—Sold by all druggists, and at Professor Holloway's establishment, 244, Strand, London.

ON RAILWAY ECONOMY.

The importance to every community, of facility of communication and transit for passengers and merchandise from one part of a country to another, and between different states in every portion of the globe, has been dwelt on by most writers on political economy within the past two centuries; and Raynal observes, "Let us travel over all the countries of the earth, and wherever we shall find no facility of passing from a city to a town, or from a village to a hamlet, there we may pronounce the people to be barbarians." When we consider the vast change which has been brought about in our ideas of time and space, in the social habits, manners, and morals of the people, the development of the capabilities of districts and localities before unknown to the inhabitants themselves, and the wide spread increase of trade and commerce by the introduction of the railway system, we feel some surprise that in the lapse of nearly twenty years we have had no treatise entering fully and deeply into the subject, showing its influence on human progress, its powers in directing, controlling, and regulating the great engines of manufacture and commerce, and in opening up new and extensive fields for the operation of the energies of the human mind. All the works on railways of any importance, which have hitherto appeared, have been strictly mechanical or statistical, and it has been left for Dr. Lardner to supply this desideratum in a work now before us, in which he has analysed the subject in all its comprehensive bearings, giving full descriptions of the entire organization of a railway administration, mechanical and statistical details connected with the ways and works, locomotive power, carrying stock, maintenance and reproduction of rolling stock, clearing-house, passenger and goods traffic, full analysis of expenses, receipts, tariffs, and profits, investigations into the causes and results of accidents, with plain rules for their prevention, electric telegraphs, inland transport in the United States, with a review of foreign railways, and the influence of improved transport on civilisation. The volume contains, in fact, a mass of valuable deductions, obtained from many years' practical experience in railway travelling, in all parts of Europe and America, by one whose mind has been devoted to a thorough investigation of the benefits the system is capable of conferring on every civilised community; and into those principles and management of economy which, while they offer the most complete accommodation to the public, will secure to those who subscribed the capital for the purposes of construction, that fair return to which all money invested in great public works is legitimately entitled. We now proceed to give a few extracts from the work, not so much as specimens of the author's clear and fluent style of expression, which is so well known, as to give some idea of the mode in which the various subjects are treated, and to create in our readers minds a desire to be further acquainted with the contents. On the influence of improved mode of transit on every civilised community, after premising that those who do not possess the means by which the products of labour and thought are transferred from one place to another have not emerged yet from barbarism, he says:—

Nevertheless, this art has been, of all others, the latest in attaining a state of perfection; so late, indeed, that the future historian of social progress will record, without any real sense of surprise, that the creation of one of the events which have most eminently signalled the present age and generation. For, although transport by land and water was practised by our forefathers, its condition was so immeasurably below that to which it has been carried in our times, that a more adequate idea of its actual state will be conveyed by calling it a new art, than by describing it as an improvement on the old one. But if human invention has been late in directing its powers to this object, it must be admitted to have nobly compensated for the tardiness of its action by the incomparable rapidity of its advancement. It has produced, when once they have been brought into play, within 100 years more has been accomplished in facilitating and expediting intercourse, than was effected from the creation of the world to the middle of the last century. This statement may, perhaps, appear strained and exaggerated, but it will bear the test of examination. The geographical conditions of the world, the distribution of the people who inhabit it, and the exclusive appropriation of its natural productions destined for their use, to the various countries of which it consists, have imposed on mankind the necessity of commerce, and commerce is nothing more than the interchange of the productions of industry between people and people. Such interchange presupposes the existence of the art of transport by land and water. In proportion to the perfection of this art will be the extent of commerce. A people incapable of communicating with others must subsist exclusively upon the productions of its own labour and its own soil; but Nature has given us desires after the productions of other soils and other climates. Besides this, the productions of each particular soil or country are obtainable in superabundance. They are infinitely more in quantity than the people by whom and amidst whom they are produced have need of; while other arts, such as agriculture, have a limitation, having a superfluity of some products and an insufficiency of others. The people of South Carolina and Georgia have a superfluity of cotton, the people of the West India Islands have a superfluity of coffee and tobacco, the people of Louisiana have a superfluity of sugar, the people who inhabit the vast valley of the Upper Mississippi and Missouri have a superfluity of corn and cattle, the people of civilised Europe have a superfluity of the products of mechanical labour, those of France have a superfluity of silk goods, England of manufactured cotton, porcelain and hardware. Each of these various peoples is able and willing to supply the others with those productions in which themselves abound, and to receive in exchange those of which they stand in need, and which abound elsewhere. But, to accomplish such interchanges, means of transport must be provided, and this transport must be sufficiently cheap, speedy, safe, and regular, to enable these several productions to arrive with their consumers, and be delivered on such terms and conditions as will be compatible with the ability of the consumer to purchase them.

On the proportion of the cost of transport to the value of the raw material, he says:—

Let us take the example of raw cotton produced on the plains of South Carolina or Georgia. This article is packed in bales by the producer at the place of production. These are then transported to Charleston or Savannah, whence they are exported to Liverpool. Arriving at Liverpool, they are transferred upon the railway, by which they are transported to Manchester, Stockport, Preston, or some other seat of manufacture. The raw material is there taken by the manufacturer, spun into thread, woven into cloth, bleached and printed, glazed, and finished for the consumer. It is then re-packed, and again placed on the railway and transported once more to Liverpool, when it is re-embarked for Charleston or Savannah, for example. Arriving there, it is again placed on a railway or in a steam-boat, and is transported to the interior of the country, and finally returns to the very place at which it originally grew, and is re-purchased by its own producer. Without going into arithmetical details, it will be abundantly apparent how large a proportion of the price thus paid for the manufactured article is to be placed to the account of the transport and commercial expenses. The article has made the circuit of almost half the globe before it has found its way back in its manufactured state.

On the comforts to all classes, the stimulus to health, and the advantages, in a pecuniary form, which result from those improvements which bring agricultural districts in close and rapid communication with large cities and towns, and thus furnish means for the supply of perishable articles of provision and human food in a sweet and wholesome state, the author thus forcibly observes:—

The benefits which would accrue to farmers and landlords, as well as to the inhabitants of towns, by placing extensive lines of railroad through populous districts, connecting them with those places from which supplies of food and other necessities might be obtained, are always considerable. The fictitious values which tracts of land immediately adjacent to the railway and the towns acquire from the proximity of the markets, is thus modified, and a portion of their advantages transferred to the more remote districts; thus equalising the value of agricultural property, and rendering it, in a great measure, independent of local circumstances. The profit of the farmer and the rent of the landlord are augmented by the reduced cost of transport, while the price paid by the consumer is diminished; the advantages of centralisation are realised without incurring the inconvenience of crowding together masses of people within small spaces, and the whole face of the country is brought to the condition, and made to partake of the opportunities of improvement which are afforded by a metropolis, and by towns of the larger class. Steam navigation affords many striking examples of like advantages obtained in the transport of perishable productions. Pines are now sold in the markets of England, which are brought from the West Indies; various sorts of fruit are likewise brought from the countries on the coast of Europe which could not be transported in sailing vessels, as they would not keep during the voyage. Oranges are sent in large quantities from the Hawaiian to New Orleans and Mobile, in the United States; when they are brought by sailing vessels, a large proportion of the cargo is lost by the destruction and deterioration of the fruit; when sent by steamers, they arrive sound. The utility of an article often depends on its place. Thus, what is useless at one part of the world will become eminently valuable if transmitted to another. We have already given example in this in the case of agricultural manures. Others present themselves. Ice at mid-winter in Boston, Halifax, or St. John's, has no value; but this ice, properly packed and embarked, is transmitted to the Havannah or Calcutta, where a price is readily obtained for it which pays, with profit, the cost of the voyage.

And of the importance of rapid means of personal transport, thus:—

So far as relates to the transport of persons, the advantages of increased speed are equally remarkable. The population of a great capital is condensed into a small compass, and, so to speak, heaped together, by the difficulty and inconvenience of passing over long distances. Hence has arisen the densely populated state of great cities like London and Paris. With easy, cheap, and rapid means of locomotion, this tendency, so adverse to physical enjoyment and injurious to health, is proportionally neutralised. Distances practically diminish in the exact ratio of the speed of personal locomotion. And here the same arithmetical proportion is applicable. If the speed by which persons can be transported from place to place be doubled, the same population can, without inconvenience, be spread over four times the area; if the speed be tripled, it may occupy nine times the area, and so on. Every one who is acquainted with the present habits of the population of London, and with those which prevailed before the establishment of railways, will perceive the practical truth of this observation. Is it not now unusual for persons whose place of business is in the centre of the capital, to reside with their families at a distance of from 15 to 20 miles from that centre. Nevertheless, they are able to arrive at their respective shops, counting-houses, or offices, at an early hour of the morning, and to return without inconvenience to their residence at the usual time in the evening. Hence, in all directions round the metropolis in which railways are extended, habitations are multiplied, and a considerable part of the former population of London has been diffused in these quarters. The same will, of course, be applicable to the country which surrounds all other great towns. It is felt at Paris, Brussels, and other capitals of Europe, just in the same proportion in which they are supplied with railway communication.

Our space does not allow for any further extracts, although similar striking passages abound throughout 524 pages; yet we cannot close these remarks without a few observations from plain rules laid down by the author, for the guidance of railway travellers, and for preventing accidents, which would do well to be printed and placed at every station, and in every railway carriage. First, he recommends—never attempt to get out of a railway carriage while it is

"Railway Economy: a Treatise on the New Art of Transport, its Management, Prospects, and Relations, Commercial, Financial and Social; with an Exposition of the Practical Results of the Railway in Operation in the United Kingdom, on the Continent and in America." By DIONYSIUS LARDNER, D.C.L., &c. London: Taylor, Walton, and Mabery, Upper Gower-street, 44, 45, 46, Paternoster-row.

moving, no matter how slow. A railway train moving at the rate of a fast stage coach seems to go scarcely as fast as a person might walk. To this circumstance, which is attributable to the extreme smoothness of the motion, is to be ascribed the great frequency of accidents arising from passengers attempting to descend from trains while in motion. This is the most common and fatal cause of accident, owing to want of due caution. Never attempt to get into a railway carriage while moving, however slow the motion may be. Never sit in any unusual place or posture. Never lean out of window, or put out an arm, or, where there is no door a leg. Never get out at the wrong side of a carriage; the rules of the road are precisely similar to those of the old coach roads, and the left hand door is always that by which passengers descend on to the platform, or enter the carriages from it. Never pass across the rails, unless absolutely necessary, and then do so with great caution. Express, special, and excursion trains, are more dangerous than the ordinary and regular trains. If the train should be stopped by an accident, it is generally safer to leave the carriage, but do so cautiously, remembering the above rules. Beware of yielding to a sudden impulse, if your hat blows off, or a parcel drops. A carriage near the centre of the train is generally the safest. If you travel with your private carriage, do not sit in it on the line, but prefer one of the regular train carriages. Beware how you cross a coach road over a railway by a level crossing. It is an excellent maxim to keep your place in the carriage to the end of your journey; if you must get out at intermediate stations, do so as seldom as possible. And generally, when you can choose your time, travel by day rather than by night; and, if not urgently pressed, do not travel in foggy weather. We must now close, for the present, our notice of this interesting and instructive volume; a volume which, while it contains all those minutiae of description in railway detail, which, as with other similar subjects, is generally considered dry reading, contains a charm that insensibly carries the reader from one chapter to another; while the results of practical experience there shown, the deductions drawn from years of observation, the many important facts established, far from being generally known, and the recommendations for the well government of railway establishments there suggested, will, we have no doubt, tend to great good, and lead directors to such a reformation in management, as shall not only secure perfect comfort and safety to the public, but put the circumstances of many bodies of unfortunate shareholders in a much improved position.

Sections of the London Strata: to which is prefixed a Block Plan of the Metropolis and its Suburbs. By R. W. MYLNE, C.E., F.G.S., F.S.A., and F.I.B.A. London: J. Wyld, Charing-cross East, and Royal Exchange.

A correct knowledge of the geological formation upon which London is situated, is not only interesting as a great feature in science, but of the utmost importance to the architect, and the civil engineer in securing good foundations for massive erections, in railways and draining, tunnelling and well sinking. We have hitherto had but meagre and inaccurate information as to the extent and depth of the undulations of the surface of the chalk, and the plastic clay and sand between it and the blue clay; and the author of the work before us, by a careful investigation of all the deep wells in the metropolis, produced a representation of the various depths at which the several clays and the chalk is reached. Within the past 12 months, an additional impulse has been given to such investigations from the increasing interest taken by the public in every thing connected with sanitary improvements, and is undoubtedly a subject of the utmost importance. The map of London, recently published, after the trigonometrical survey, gave the correct measurement of the heights of the different points above Trinity high-water mark; and the five sections now published are from Hampstead to Camberwell, Highgate to Peckham, Stoke Newington to Deptford, in a north and south direction, and Chiswick to West Ham, and Kensington to Greenwich Marshes, in an east and west direction. It is intended to complete the last four sections, making nine in all, as soon as circumstances will admit of perfecting them, when they will be published with a surface map, giving the situation of the wells as figured in the sections. Some letter-press will be added, descriptive of the different wells, with general notices of subterranean works. The sections are beautifully lithographed, and printed on fine stout paper, showing the positions of all the streets and prominent objects which they cross, and the height above the surface of the chalk, with a vertical scale on both right and left hand, which facilitates the inspection of the depth of the wells and borings. The publication must prove of much utility to all persons interested in a knowledge of the London strata; and, on publication of the concluding part, will together form a highly valuable work for reference.

SUPPLEMENT TO THE "POST-OFFICE LONDON DIRECTORY."—We have received the annual periodical number of this auxiliary to the *Post Office Directory*, which is made up a few weeks subsequent to the assembling of Parliament in February, completed in the same correct state which marks the bulky and useful volume to which it is an appendage. Among the varied information which it contains, this supplementary volume enables the public to have for reference a complete Parliamentary directory made up to the eve of publication, with the country seats and town residences of the Peers and Members of the House of Commons. It also contains a supplement consisting of persons who have commenced business since the compilation of the directory for the present year, and alteration of names therein; also a complete postal directory, containing all the postal regulations for the kingdom, and an alphabetical list of 5000 places throughout the world. In conjunction with its parent volume, it forms one of the most extraordinary publications of the day.

ACCIDENTS.

Explosion of Fire-damp at Wigan—Thirteen Lives Lost.—An explosion took place at Messrs. Evans and Turner's colliery, in Haydock, situated about 1½ mile from Newton race-ground. The explosion occurred in what is called the "Rock-pit," and 14 persons were either burned or smothered to death, some of them being literally burned to a cinder. It appears that 11 of the parties were working in a drift 1000 yards from the pit-eye, without any conductor, when the explosion took place, all of whom were burned to death. Two others were working about 120 yards nearer the pit-eye, and they, on hearing the explosion, rushed into the face of the fire, instead of making to the pit-eye. The sufferers were—John and Ralph Durdon, father and son, Wm. Batterby, Wm. Knowles, Ralph and John Unsworth, father and son, John Glare, John Holloway, John Sinn, James Bailey, Christopher Hesketh, Thomas Glover, and Joseph Hutton. The men were allowed safety-lamps, if they thought proper to use them, but there does not appear to have been any restriction against working with naked candles, although a queen had run away from the fire the day before the fatal occurrence took place. The inquiry was held on Monday last, when the jury returned the following verdict:—"It so happened that the foul and inflammable air in the said coal mine, by some means unknown to the jury, accidentally, casually, and by misfortune, took fire and exploded, whereby the said unfortunate men and boys were grievously scorched and burned upon the body and limbs, whereby they instantly died."

Bilston.—As R. Nutter was endeavouring to make his escape from an impending fall of rock, in Mr. Ward's Priest-fields Colliery, the heel of his boot caught against a bar of iron forming part of the railway at the bottom of the pit, which threw him down upon the ground, and an immense weight of rock and ironstone fell upon him. On extrication, his right leg was found to be dreadfully mutilated, the integuments and muscular structures being extensively torn and lacerated, and the bones fearfully crushed. Amputation of the limb being determined upon, the surgeon of the colliery skillfully succeeded in operating immediately below the knee, and the poor fellow has been going on well, and is likely soon to recover from the consequences of the accident.

Bilston.—Mary Underwood, the wife of the engineer at the Spring Vale Iron-Works, was standing by the boiler when it suddenly burst, and covered her with bricks and rubbish; she was so much injured that she survived only a few days.

Dudley.—Thomas Little, 14, and James Plant, 13 years old, were suffocated in a pit of Mr. Thomas Yardley, at Dock, which they had descended after a fowl, although cautioned that it was dangerous.

Widnall.—William Naylor, a boy 13 years of age, was drawn over the pulley of the frame of the pit at Bunker's Hill Colliery, and killed on the spot. The engineer, who had been accused of neglect, attended the inquest, and exonerated himself from blame.

Boiler Explosion—Paisley.—Yesterday week, at half-past seven o'clock in the morning one of the steam-boilers attached to the Aberdeen Iron Foundry of Messrs. John Dixon and Co., exploded, with a tremendous report. The boiler was completely lifted out of its bed, and thrown through the wall of the engine-house into the yard. Fortunately no lives were lost, but three of the workmen were slightly injured, by masses of rubbish falling through the roof. The engine-house was completely demolished, and some of the roofs of other buildings injured.

Fatal Smelting Accident.—An accident occurred at the Golden Dale Iron-Works, near Tunstall, which caused the death of one of the workmen, and severely injured two others. The workmen had "tapped" the furnace, thrown off the blast, and run off a quantity of the metal, when they found it necessary to insert a valve in one of the furnaces, to blow the remainder of the metal out. This was done—but as soon as the valve began to blow, a body of fire and heated metal was forced out of the tap, and burnt George Whitehurst (deceased), and another of the workmen. Another workman was burnt whilst attempting to stop the valve. An inquest was held on Sunday, and it was quite possible that day or the next for another to occur: he was not, however, prepared to point out a remedy. The danger was increased by their using, at the present time, an ironstone which broke into small pieces. Mr. Harding, the coroner, reminded Jones that it was his duty to represent the state of the works to Mr. Williamson, his master. If Jones did not attend to this direction, and another such accident should occur, the coroner said a jury would, in all probability, find a verdict of manslaughter.—*Staffordshire Advertiser.*

COMPENSATION FOR LOSS OF LIFE IN A COLLIERY.—In the Jury Court, Glasgow, yesterday week, an action was tried in which Mary Ann Wark, widow, was plaintiff, and Messrs. Russell and Beith, coalowners, defendants. The plaintiff sought to recover compensation for the death of her husband, James Wark, a coal hewer, in employ of defendants, through whose negligence, or that of their servants, it was alleged his death was caused. After a lengthened trial, which lasted the whole day, the jury found a verdict for the plaintiff—damages 200l. for the widow, and 50l. for each of the children, being one-half the amount at which the damages were laid.

INSPECTION OF MINES AND COLLIERIES.—In the House of Commons, on Monday, in answer to a question put by Mr. Wyld, Sir G. Grey stated that he expected to receive shortly the report of the three gentlemen who were engaged in inquiry into the causes of accidents in mines and collieries, and hoped to be able soon to introduce a Bill on the subject, founded upon their reports.

THE GOLD AND TIN WASHING DISTRICTS—No. IV.

BY E. HOPKINS, C.E., F.G.S.

The Cornish miner, more especially in the stanniferous districts of Cornwall, is getting now so well acquainted with the character of the crystalline rocks, that he knows from mere appearance of a specimen what kind of granite will produce tin. Schorl appears to be an essential ingredient, or, at all events, a constant associate of the oxide of tin.

Near St. Austell, Dartmoor, and the Land's End, the oxide of tin is in some places so much disseminated through the schorliferous granite as to render it worth quarrying for the extraction of the tin. All the metals that are found in this disseminated state are, as above noted, always more pure than when they are found in veins. Those elements which produce joints and fractures, and the formations of veins in the crystalline base, effect the accumulation of the metals in the recesses, at the expense of a considerable amount of alloy of mineralizing substances, such as iron pyrites, the arsenical pyrites, &c.; consequently, metals obtained from veins are never so pure as those procured from the decomposition of metalliferous rocks; when dispersed in the latter, they are comparatively unalloyed. It is important to bear this constantly in mind.

The stanniferous, like the auriferous rocks, are often very friable, and subject to disintegration; the felspar decomposes into clay, according to the character of its component parts, an exfoliated oxidated crust is formed, which is gradually washed down to the ravines, where the several substances are deposited according to their respective gravities—the oxide of tin, being the heaviest, will occupy the lowest beds in each accumulation. There was a time when miners did fancy that these alluvial deposits of minerals came from lodes, and geologists considered lodes as volcanic productions, but, fortunately for our industrial science, such erroneous notions are now almost matters of history with practical men. Some vain attempts have been made to determine the age of this superficial detritus of stream tin, and its associated gravels, but to no purpose; it is like that undefined and improper term, diluvium—it belongs to all ages. Sometimes we find the tin-stone pebbles, the comminuted quartz grains, and the oxide of tin, left behind on the parent rock, and the decomposed felspar washed away, and this covering becomes so thick as to prevent further decomposition.

In the Indian Archipelago the same phenomena occur, especially in the island of Banca. This island, with its ridges, conforms in its direction to the Asiatic ranges of mountains—i.e., running north-east—and is composed principally of granite, both ferruginous and schorliferous—the predominance of the former giving it a general red colour. The oxide of tin is disseminated more or less throughout the schorliferous granite, and is found in beds at the foot of the granitic range, either immediately under the surface, or at no great distance below it—the greatest accumulations are mostly found in low situations near the schorliferous ridges. These deposits are composed of clay of various colours, from pure white to yellow and red. The most productive beds of tin ore have been found near the central parts of the peninsula, at the junction of the districts of Singiebulu, Klabbet, and Tengá.

The lowest bed is generally of the purest white colour, very light, and adheres strongly to the tongue, like pure clay, on which the ores of tin are deposited in layers differing in richness and extent, according to the locality and the quality of the parent rock. Sometimes the tin is found dispersed through the whole of the bed, commencing immediately under the soil, and increasing in quantity towards the bottom. The schorl in the granite is often seen in black strings, intersecting each other at different angles, and also in elegant needle-form crystals adhering to the fragments of quartz, and likewise disseminated through the quartz in minute rhomboidal crystals, which renders the granitic mass loose and friable. In some parts the minute particles of schorl are barely perceptible; in other portions this substance is uniformly mixed throughout the stone; and again, the granite changes into a different compound, in which schorl cannot be detected. In all the stanniferous granitic rocks the mica is but sparingly distributed, the admixture being quartz, felspar, and schorl in variable proportions. The exfoliated beds formed by decomposition *in situ*, on the surface of the granite, consist of fragments of quartz and felspar, with small particles of schorl, and the oxide of tin. Sometimes coarse fragments of decomposed granite are seen with breccia, through which the oxide of tin is disseminated. The productivity of the deposits of the valleys gradually diminishes as the acclivity of the hill increases, similar to that already noted in gold-washings, and thus plainly showing the origin of these alluvial metallic deposits. All persons engaged in such works should never forget this most important fact. These superficial processes of decomposition and deposit, are constantly going on in every region of the earth where the primary rocks are exposed to the atmosphere.

ENGLISH DIAMONDS FOR CALIFORNIAN GOLD.—Large orders have been received in Newcastle-on-Tyne for coal from California. San Francisco thousands over the produce of her "diggings," in discharge for our "black diamonds."

CALIFORNIA.—We have advices from Philadelphia to the 1st inst., containing the latest news from California. A letter from Stockton, on the Bay of San Francisco, about 100 miles from that city, states that the writer, with a party of four, went searching up the gorges of the mountains; for weeks they were unsuccessful in finding gold of any consequence, but came at length on a bunch, which, in 15 days, produced them 15½ lbs. He states, however, it was no child's play to realise it, but hard and persevering work; some of the pieces found weighed from 1 to 3 ozs., and the whole was very pure. With hard labour and perseverance, he describes it as a general consequence to be successful. Many of the emigrant gold-seekers have, however, been sorely disappointed, prospects at home blighted, health ruined, and yet having no means to return, are compelled to stay, dragging out a wretched existence, till it terminates in the grave. Some have endured inordinate sufferings; many leave the mountains perfect living skeletons, only to deposit their bones in San Francisco, Sacramento, or Stockton. Many are crazy; some commit suicide; others drink ruin till they die; some are butchered in personal encounters; while many lay down their frail bodies among the rocks, and die from exhaustion and exposure. He describes the land generally as poor, and, owing to the length of the dry season, incapable of producing farming or garden crops. Immense quantities of gold have been found by the Mexicans near Sonora, and it is thought that many of the United States emigrants will bend their steps in that direction. But in the overland expeditions there is much danger, and we have just received the account of another massacre of Americans between El Paso and the Rio Gila. As a proof of the exciting nature of successful gold-seeking, it is stated that Mr. J. Stickney, of Boston, arrived at his home a few days ago from San Francisco, with a large fortune, and almost immediately committed suicide. The excitement of adventure and prosperity had tumbled reason from her throne. The latest accounts are to Jan. 15, by the arrival of the *Alabama* at New Orleans, from which we learn that the city of Sacramento has been completely submerged by the overflow of the river, swelled by the mountain torrents. Only one house, and that built on raised poles, was above the water, which was 3 or 4 ft. deep. Immense herds of cattle have been drowned—the inundation extending over the entire valley of Sacramento, and varying from 20 to 50 miles in breadth, from the Sierra Nevada to the coast range of mountains. Much misery, starvation, sickness, and death, must be the natural results of this great overflow. The loss of property at Sacramento city is estimated at \$1,000,000. The sufferings of the inhabitants there are described as dreadful, and few spots of land were visible. But one writer consoles himself by stating that this great flood, while it destroys much property, "will wash out the gold in immense quantities." The *Alabama* brought 65 passengers, and \$500,000 in gold. The American diggers had been attacked at Stockton by large bands of Chilians, and numbers were killed on both sides. It was expected that the whole of the Chilian and Spanish races would be forcibly expelled from the country. The remains of a city of much grandeur, which had, in some remote age of civilization, existed there, is reported to have been discovered a short distance inland from the Bay of San Francisco, consisting of the foundations and ruins of temples, pyramids, dwellings, &c. Notwithstanding the sufferings of many unfortunate emigrants, there is no doubt the *fièvre* will still exist for obtaining wealth for the seeking, and as population becomes more settled, better facilities for living will be afforded. The speculation now proceeding in England and America, in the erection of iron houses for the gold regions, will promote this. One on a large scale was exhibited last week at the Victoria Works of Messrs. McKean and Perkins, Birkenhead, on which occasion upwards of 200 ladies and gentlemen partook of luncheon in the upper story. The framing is of T iron, formed so as to clip the corrugated galvanised iron, of which the whole is composed, which is so arranged as to have the appearance of Venetian latticing. The internal appearance is very effective, and the roof light and elegant. The principal combines the greatest degree of strength with the smallest possible quantity of iron, and is the first of a series for exportation to America which this firm is constructing. Its cost has been about 2000l.

ABERDEEN RAILWAY.—It appears that the cutting through the rock at the Cove, about four miles from Aberdeen, has been accomplished, and the permanent way laid. The completion of this heavy portion of the works has long been regarded as the measure of the time for opening the line to Aberdeen, which is expected to take place in the course of a few months from this time.

Original Correspondence.

THE DEVON GREAT CONSOLS MINE.

Sir,—Seeing that your talented correspondent, Mr. Murchison, has given us the result of his inspection of the Tavistock district, and is about furnishing us also with the geology of the formation, I beg to request the favour of your reprinting my letter on the subject, which appeared in your Journal, No. 674 (July 22, 1848), signed "E. H." Tavistock.

I intended on that occasion to have shown the character of what has been called the "Great Wheel Maria" westward, the branchy nature of the lode and the different rocks it intersects in that direction, and in which so many mines, have been, and are still, working, in hopes of finding, some day or another, the "Great Wheel Maria;" with what success, I must leave others to answer. According to the notions of some, lodes are continuous for hundreds of miles; and, provided we sink through the superficial sedimentary beds, we may find the Devon Consols lode in Wiltshire! Such ideas are also prevalent amongst some of the mining agents in Wales, where rich lodes have been fancifully traced for miles into the adjoining counties; therefore, the reprinting of the letter alluded to may be of some service in calling attention to the subject at this moment, as numerous engagements will not allow me time to enter into them. I have no doubt but what Capt. M. Francis, Ennor, and others, whose practical knowledge of the subject I highly appreciate, will render their valuable aid in this most important question in mining, and in which the prosperity of our mining industry depends.—EVAN HOPKINS: March 20.

The circumscribed nature of the metallic parts of lodes, together with that of the bunches, conforming to the dip of the structure of the bounding rocks, and the influence of cross-courses and impermeable splits (flookan and alides) have on the accumulation of minerals in lodes, are very pointedly exemplified in these great mines, and show how very essential it is to know the way by which metalliferous deposits are governed, to ensure the success of such undertakings. It is now well established, that the occurrence of the useful metals in rocks and veins is not the effect of blind chance, but according to laws and order, as beautiful as that observed in the economy of the vegetable kingdom; but the knowledge of these laws, and to know how to apply them usefully to mining, can only be acquired by a very long experience in mines, with careful research, and note and study every phenomenon in all the variety of rocks. Any attempt at generalisation, or prediction, without these requirements, founded on long practice, would only lead to incorrect analogies and conclusions from wrong assumptions, and thus, instead of rendering any service to the miner, would lead him astray, and consequently to a waste of capital.

I have been led to make the above observations in consequence of what has been said and written on the mining district of Ashburton—viz.: "That it belongs to the carboniferous series;" and also the following inference, or comparison, which has been drawn between the Ashburton district and the Devon:—"In similar schistose rocks, having the same geological characteristics, on the opposite or west side of the Dartmoor granite, some of the richest and most valuable mines known in the south-west of England are now being worked." Had the analogies been correct, or had the two districts a common bond of connection, in a mineralogical sense, the above would lead men who are guided by general laws to conclusions diametrically opposite to those intended by the author of the above report, and, therefore, shows the necessity of being guarded and well-advised when making such observations, especially if their practical bearings are not sufficiently understood by the writer. The only apology that can be made for the use of the appellation "carboniferous" is the detection of a few fossils, which are characteristic of that series; but this is merely a thin superficial covering, lying on the argillaceous rocks skirting the Dartmoor granite, and have, in fact, nothing to do with the metalliferous rocks below. Had the formation been what is understood "carboniferous" it would be unfavourable for copper, and most unpropitious for tin. However, such is not the case; it is a schorliferous killas, and consequently favourable for tin—but whether sufficiently abundant or not to pay for working, remains to be seen. With respect to the next question of the parallelism between the Ashburton and Tavistock, it is not apparent; they are two distinct metalliferous rocks; and the high and visible mass of the Dartmoor granite does not appear to have had any influence on the dip of the bunches, as their declination is easterly on both sides; the great crystalline granite rock can only be considered as a large nodule, between Ashburton and Tavistock, having resisted further decomposition.

I shall now enter more in detail on the nature of the great bunches of ore in the Devon Great Consols, to show that they are all cut off by north and south flookans, on the side next to the granite, and rise to the surface westward; or, in other words, they all dip to the west, and are situated on the western side of their respective alides, or cross-courses. **Wheel Maria.**—The bunch of ore is cut off in this set on the east, near Morris's shaft, and extends westward for about 100 fms., gradually rising towards the surface. Gard's shaft, 70 fms. from the above, on the west of the set, is sunk through the lower limit of the bunch at about 35 fms.; but, in Morris's shaft, it extends downwards to the 50. Both shafts are now in barren ground, but the latter is still sinking in search of another bunch below.

Wheel Maria.—The engine-shaft is sunk to the 60 fms. level, and the bunch continues to hold good. According to the appearances in the western levels, the dip is to the east—consequently, the productive part of the levels west will diminish in length as they descend. Near the shaft is a slide declining east, and all the levels driven east of which are unproductive—the mineral being completely cut off by the intersecting impermeable vein.

Wheel Maria.—The two shafts are down to the centre of the bunch, and levels have been driven many and west, and it has been found as above—dipping eastward. There is no slide in this set, but there are several cross-courses intersecting the country between the shafts, in the middle of the ore ground, which have disordered the lode. **Wheel Maria.**—The great and rich bunch in this set is also declining east. The western shaft is sunk to the lower limit, but the eastern has still a great depth to get to the bottom of the bunch at that point. The last two mines are very productive, and likely to continue to afford a permanent supply for many years; as the character of the deposits is well understood, and the superintendent of the mines, the productive parts will be properly developed, and the unproductive avoided, as well as the points carried on for making new discoveries judiciously chosen, by which means the success of the undertaking is ensured. On the other side of the Dartmoor granite, the rocks appear to be more stanniferous, and less cupriferous than those on the west, and the tin much disseminated in the decomposed schorliferous channels, and dipping east under the calcareous sedimentary beds of Ashburton. The structure of the country is also somewhat different, and, therefore, does not present such well-defined east and west lodes as those of the Devon Consols. However, as these mines are, like old gold washings in auriferous rocks, irregular excavations, and nearly all superficial workings, there may be veins of greater magnitude below; but little can be said without a more minute and careful examination of the metalliferous channels in depth.

FORMATION OF MINERAL VEINS.

Sir,—In reading your very interesting Journal of last week, I observed a long list of queries by Mr. N. Hitchens, of Derry, with respect to the formation of mineral veins, &c. It is evident, from your correspondent's queries, that he has not perused Mr. Hopkins's instructive and valuable work on *Terrestrial Magnetism*, where in chapters 6, 7, 8, and plates 14 and 15, I think he will find the full information sought—viz.: with regard to the formation of mineral veins. Regarding the temperature, and the other queries, brought forward, no general reply can be given to suit every case, as these entirely depend upon local circumstances; but even on these points your correspondent would be much enlightened by further perusing chapters 3 and 4 of the same work, as mentioned above. ALBERT DUMARÉSQ.

Upper Montague-street, Montague-square, March 19.

ON THE GEOLOGICAL FORMATION OF THE EARTH.

Sir,—Mr. Hopkins's paper on geology, will, I have no doubt, create great interest in our mining districts. We want a man who can predict with some degree of accuracy the point at which a metalliferous deposit is to be met with. I would advise Mr. Hopkins to lose no time in paying a visit to this part of the United Kingdom; he will find unlimited scope for his geological researches in connection with mines; and I have no doubt his talents in this particular branch of our industry will be duly appreciated by the adventurer; for my own part, I would much like to take Mr. Hopkins's opinion professionally on a "bal" or two I have some connection with. Geology most certainly affords the miner no small assistance in his explorations below the surface. I cannot imagine, however, that a visit to the Cordilleras will enable a person to judge more correctly, or with greater certainty, geologically, in respect to our home mines.—GEORGE CHOWEN: *Dipperton*, March 18.

ANGLO-CALIFORNIAN GOLD MINING AND DREDGING COMPANY.

Sir,—My attention has been drawn to a paragraph, in your Journal of the 16th inst., reflecting on the *bona fide* character of this company, and which paragraph is so entirely at variance with truth, that, on behalf of the company and shareholders, I must request an immediate insertion of this letter, in order that the minds of such of the public as may have read the article, may be disabused of the prejudice likely to have been created by it.

Assuming that you are at all times ready to correct anything which you have erroneously stated, I beg to call your attention to the unfounded allegations in the article. Firstly, you state that the advertisement of the company has suddenly made its appearance in a provincial paper, and that it has not been advertised in a single London newspaper. I am somewhat astonished that you should make such an assertion, when the public are well aware that the project has been frequently advertised in the *Times*, and other leading London newspapers, during the last six months, the full particulars of which I am prepared to prove by the production of the papers containing the insertions.

As regards the *Diana*, you seem to have made your observations in ignorance of all particulars relating to the company, or to its project, and I, therefore, beg to inform you that the company, having purchased the right to work the lands of Santa Vaga, have already dispatched the first expedition of Cornish miners, machinery, &c., by the *John Calvin*, which vessel sailed from Plymouth on the 22d January last, and that the said expedition was accompanied by Capt. Sir Henry Vere Huntley, R.N., late governor of Prince Edward's Island, one of the directors, who undertook the command and chief superintendence of the works in California on behalf of the company and shareholders. Upon reference to the *Times* paper of the 25th January last, you will see the announcement of the departure from Plymouth.

The *Diana* sailed from the St. Katherine Docks for Plymouth on the 19th inst., having on board the remainder of the machinery and mining tools belonging to the company; and the second party of miners will embark in that vessel at Plymouth on Monday next, whence they will sail direct for San Francisco.

* On the Connection of Geology with Terrestrial Magnetism: showing the General Polarity of Matter, the Meridional Structure of the Crystalline Rocks, their Transitions, Movements, and Dislocations, including the Sedimentary Rocks, the Laws regulating the Distribution of Metalliferous Deposits, and other Magnetic Phenomena. By EVAN HOPKINS, C.E., F.G.S. London: *Mining Journal* Office, where copies may be had.

For the truth of the above, I beg to refer you to Messrs. Aubert, Thompson and Co., of Trinity-square, Tower-hill, and James Thompson and Co., Billiter-square, Fenchurch-street, who are the owners, both of the *John Cubis* and *Diana*, and who will readily vouch for the accuracy of my statement. The Lords of the Admiralty will also satisfy you as to Sir H. P. Huntley having departed by their leave to take command of the first expedition. As regards the report to which you have alluded, it is possible a more scientific and elaborate production might have been prepared by Mr. Hopkins, or many other eminent mineralogists; but inasmuch as Mr. Palmer did not undertake to do more than transmit a general report upon the gold district, and secure land on behalf of the company (not professing to be a mining colon), his phraseology ought not to be found fault with, the objects of his mission having been fully accomplished. I have been compelled to trespass on your space at greater length than was my intention, but for the sake of doing justice to all parties, I shall feel obliged by your inserting the whole of this communication.

Albion Chambers, Adam-street, Adelphi, March 21.

[We readily insert the above communication in answer to our remarks, happy to find the undertaking to be of a more legitimate character than we estimated it. Mr. Williams's explanations do not, however, remove the impression from our minds that, however bona fide the concern may be, it has been carried out with anything but those usual business-like measures which, in an undertaking of such magnitude, operating at a distance of half the globe, and involving great expenditures, ought to have prevailed. For gold seeking, or other metallurgical discoveries, a manager should have been sent out who, at least, had some experience in such operations; and a report from a gentleman, in which he partially depends on returns from a metal which has never yet been found but in salt water, had certainly better have never been published. We can only wish the promoters every success, and the shareholders good dividends.]

WHEAL GROSE MINE—GARBING REPORTS.

Sir,—I am sorry to feel myself obliged, as necessary to support my position in life, to reply to a communication in your valuable Journal of the 16th inst., from my old and much respected neighbour, Mr. James Crook, respecting the improper manner in which my report of this mine was garbled and altered to suit certain views. I would, first, state that, from my long acquaintance with Mr. Crook, both in private life and as a man of business, I believe him one of strictly honourable principles, and am satisfied he does not make the slightest pretensions to being a miner, as I believe he has never been half-a-dozen fathoms under ground in his life; and I have no doubt that the "explanation" has been made by a designing party, not far distant, who has taken the liberty to borrow his name; and I am only sorry that such party should have any connection with mine of such promise, in which many gentlemen of upright principles and high respectability are concerned. I beg to state that at the time I inspected the mine, and made my report, there was not more than 18 in., instead of 31 feet, of the lode developed at the point in question; and, however, the explanation may be glossed over, I contend the falsifying my report cannot be too severely reprehended; for had Mr. Crook, or any of his neighbours, wanted further information as we laid open the lode, they had only to walk 20 or 30 yards to me, and I would have given, with pleasure, all in my power.

Eglishayle, March 18.

W. H. T. STEPHENS.

THE CWM ERFIN MINE.

Sir,—Finding you at all times willing to assist in putting down any system detrimental to the general good of mining, I am sure you will excuse my troubling you with a few matters of fact respecting this mine, fully concurring with the views expressed by "A Shareholder" in your valuable Journal of last week, in which he advocates holding meetings on the mine for examining the accounts, and to know the exact position in which we are situated, both financial as well as the real state of the mine's prospects. I attended a meeting of the shareholders of this mine in November last, at George-yard, Lombard-street, London, when the accounts were audited by Messrs. Crofts and Stride, which showed as follows:—

Balance against the mine of	£150 11 2
Since which there has been remitted:	
Nov. 10, 1849	297 0 0
Dec. 8, 1849	223 18 8
June 17, 1850	244 5 4—£215 15 2
There was then sold and not credited:—	
Twenty tons of silver-lead, at 12s. 12s.	252 0 0
" " " " " " " "	231 0 0
" " " " " " " "	276 0 0
Call made of 10s. per share	500 0 0—£299 0 0

Showing balance in favour of adventurers.....£ 343 4 10

Now, the amounts as stated in November, December, and January, was all the money the late pursuer (Mr. T. P. Thomas) remitted to the agent for paying the cost of the mine; but I find the accounts have been passed, showing a balance of 162 only in favour of the mine, and the management handed over to Messrs. Taylor and Son, no doubt thinking the unfortunate shareholders would submit to this without ever advertising to the subject, again, and thus be taxed not only with a most expensive management, but also pass over the matter as a settled fact, both as regards the management and monetary affairs. You will perceive there is a difference of £372 in the accounts, which I hope the late pursuer will be able to explain in your next Journal to the satisfaction of the shareholders, as in that case we shall know how the money has been applied, at any rate; and holding nearly one-tenth part of the mine, I fancy I am entitled to this information.—A. FRANCIS: Goginan, Aberystwith, March 19.

CWM ERFIN MINE.

Sir,—A letter in your Journal of Saturday last has been pointed out to me, signed by "A Shareholder in the Cwm Erfin Mine," dated Rhayader. I was not aware that any shareholder resided there; but that is unimportant. Whoever he be, I beg to assure him that my father and I never asked for, or in any way sought for, any part of the management of this concern; nor is there much cause to be proud of the appointment, other than being requested by parties, totally unknown to us, personally to help them to place the mine on a better footing than it has been.

The "Shareholder" must be most grossly deluded if he believes the statements which his letter contains. He speaks of the courses of ore discovered as equal to a return of 70 tons per month, and of a profit, under economical management, of 2500l. per annum. Surely he cannot be aware that the western course of ore is all but exhausted down to the depth of the bottom level, and a little of it taken up under that. The eastern course of ore also is not yet available; it has been opened merely from a winze under the 10 ft. level; and the 20 ft. level has to be brought forward to it by a cross-cut, and it is on a south part of the lode. When it is available, 12 men can be placed advantageously to work on this piece of ore ground, which is apparently improving in depth; but will not yield nearly 2 tons per ft.—at least, I fear not.

The mine requires to be well laid open, to have the shaft sunk rapidly for a 80 ft. level, and, if practicable, to be better supplied with water-power. Also to have its machinery and appliances improved and repaired, and it well deserves the outlay which will be necessary for these purposes; but to say that the mine is now in a state to make a profit, or to yield 70 tons per month, or that 10 tons of ore were returned last month, or any month, for a bona fide cost of 52l., is so utterly erroneous, and so calculated to mislead, that I feel it right to prevent such an impression gaining ground. The facts are, that the months of January and February resulted in a positive loss of 105l., instead of a profit of 100l., as stated by the "Shareholder." As to a steam-engine, I would say that I hope this outlay may be avoided. The ore ground now at command will certainly not warrant it. What the 30 ft. level may lay open, time will prove. I will not allude to the "Shareholder's" remarks upon the "economic" management lately carried on, or the expensive and complicated system which he seems to fear, further than to say that results only can prove which system is the most costly. The percentage of cost of management, and all agency over a given time and given amount of return, is the criterion to look to.—JOHN TAYLOR, Jun.: Aberystwith, March 18.

THE ASTURIAN MINING COMPANY.

Sir,—The meeting next Tuesday will, probably, influence the future state of mind of many a shareholder in this company. One of two things will then be determined, either we shall make up our minds to put an end to all further doubts, by voting for a wind-up—the sweets of Chancery, and so forth—which will be like a plucky fellow, who cuts his throat to get rid of his cares; or else we shall decide for a vote of confidence in directors, liquidators, and all men in authority, and for the reconstitution of the company. Now, my opinion is, most decidedly, that we had better cut our throats at once, than go on as we have been doing lately with insufficient funds, and thus ensure ourselves a still more miserable end, after lingering another 12 months, than we might now expect. Whatever we do, let us do thoroughly. Either let it be quite clear that there is a reasonable chance of recovering our position, and making a good thing of the Asturian Mines, and then let us all agree to pay the money, which we know is absolutely necessary to carry on the works, or else let us get out of the mess we are now in, with as little loss as possible, and by all means let the mines then go to the—There are three things to be considered—1. Is the property really valuable?—2. Is the manager in Spain capable of making it profitable to the shareholders?—3. Is it likely to be properly and honestly managed at home? The first question is really the one upon which everything else depends. If we have a valuable property, surely there cannot be any great difficulty in finding a man who can work it; there are hundreds to choose from, and I hope we have already found the proper person; and as surely also, amongst the number of proprietors, it cannot be impossible to select gentlemen who are capable of directing the affairs of such a company as ours. It is, therefore, the question of the intrinsic value of the property which ought to guide us in our decision. Now, I am able, from my own knowledge, to assert positively that we do possess a splendid property. I am well acquainted with the coal-fields of Durham and South Wales, and am confident that there is

not within 50 miles of Newcastle or Cardiff a property more admirably adapted for the economical production of either iron or coal. There are no expensive pits required in the coal mines, no machinery for pumping, and there is no difficulty of ventilation, and the coal is placed in the coke yard adjoining the blast-furnace (as I was credibly informed) at less than 2s. per ton. Then, again, the iron-works would do for models in England. I suppose every one will agree with me, that it would be difficult to excel the Cyfarthfa Iron-Works at Merthyr Tydvil, which are in my estimation the finest in the three kingdoms, and yet I do not hesitate to assert that some of the structures at Mieras surpass even those in beauty and solidity, and although, of course, on a much smaller scale, the arrangement of the different workshops is almost equally good. We may, doubtless, lament that so much money was spent on them, but once constructed they will last the longer, and, fortunately, they are now in a condition at length to give some return. The conclusion, then, that I come to is, that we ought to vote for the reconstitution of the company. I will not pretend to determine how this may best be done, neither will I place unlimited confidence in some of our present managers; but of this I am quite convinced, that if an ordinary amount of vigilance is exercised by the shareholders, to prevent any further gross mismanagement, the property is, at this day, of so great a value, that it would be egregiously folly now to abandon it, and I most sincerely hope that we shall all vote heartily together.

Clifton, March 19.

ONE WHO HAS SEEN THE MINES.

BUBBLE MINING.

Sir,—Mining in prosperity is just the time for half-bred miners, speculators, jobbers, plausible talkers, and story-telling people, to drain the pockets of the unwary capitalist; to enrich themselves, without the slightest intention of ever working the mines, so much extolled by them, but wholly for the purpose of selling that for large sums of money which is worth less than nothing. Mining, which is the source of considerable wealth to the nation, and equally beneficial to the shareholders, when legitimately followed, has been brought into disrepute by such parties, and many people ruined. I know many honest miners, who are great sufferers from these dishonest practices, and I call upon them to expose such frauds through your Journal, when they find them carried on openly, and within their knowledge; I promise them to do the same, without flinching.—A MINER AND SHAREHOLDER: March 21.

WHEAL CONCORD MINING COMPANY—WINDING-UP.

Master Sir WILLIAM HORNE, before whom the proceedings of the winding-up of this company are to take place, appointed Mr. A. M. Souby, of Chancery-lane, to be official manager, and Mr. Fry, of Mark-lane, as solicitor. The petitioner for the wind-up is Mr. John Dunkin Lee, of Lendenhall-street, whose petition was presented before the Lord Chancellor on the 13th Nov., 1849; his prayer was granted, and referred to Vice-Chancellor Knight Bruce on the 16th January last, who directed the order absolute to the charge of Sir W. Horne on the 22d of same month, after having heard the petitioner, and Mr. W. M. J. Pickering and Mr. J. Crofts, two other shareholders, in favour of the prayer of the petition.

Mr. Dunkin Lee states, in his petition, that the company was formed in March, 1845, and was composed of 30 shareholders, who had got up the scheme for the purpose of working a mine, situate in the parish of South Sydenham, county of Devon, and known by the name of Wheal Concord; that the mine was proposed to be worked on the Cost-book System, and to comprise 1024 shares; that, in accordance with this proposition, petitioner and others signed the rules and regulations, and book of agreement, and Mr. George Wells Snell, of Callington, county of Cornwall, was appointed to be pursuer to the company, and all the rules and regulations were entered in the cost-book in the usual way. That petitioner purchased from other shareholders in the company 32 shares, which were duly transferred to him, and registered in his name, so that he had become solely liable for them; that those from whom he purchased them had duly paid the calls before he bought them, which amounted to 192l., at the rate of 6l. per share; and that since he made the purchase he had paid the additional sum to which the shares had become liable—viz., 80l., or 2l. 10s. per share. That the affairs of the company had been regularly carried on by Mr. Snell until June, 1846, when the management was transferred to Mr. Crofts, who was appointed secretary to the company, and who carried on its management until July, 1847, when it was found to be a very unprofitable concern, and that its affairs had become very much embarrassed; that debts to a considerable amount had been incurred, and the whole of the materials, works, machinery, and plant had been seized, and sold under an execution at the suit of one of the creditors, while there were several debts still outstanding; that an action had been brought against petitioner by Mr. Snell and others, and he had paid large sums of money out of his own pocket in consequence; while other actions had been taken against other shareholders, who had also paid money in the same way, though many of them had not paid the calls, &c.

Annexed to the petition is an account sent in by Messrs. Gill and Rendle for a balance amounting to 148l.; and then follows an affidavit from the secretary (Mr. Crofts) to the effect, that he had given up all the books, papers, &c., to the official manager.

No day has as yet been fixed for settling the list of contributors.

BARNET AND NORTH METROPOLITAN RAILWAY.—In settling the list of shareholders, on Monday, Master Tinsley, placed the Hon. Fitzhardinge Berkeley, Capt. Pollitt, and others of the provisional committee thereon, as liable, but without at present determining the question whether they were to be placed on it as allottees, or as persons taking or bound to take shares. The amount of deposit (5000l.), which was only partially paid, the panic supervening, was spent by the provisional committee; and the petitioners for winding up state that there is a large amount of debts outstanding.

DIRECT WEST-END AND CROYDON RAILWAY.—Thursday being the day fixed for settling the list of the provisional committee, who had not been members of the managing committee, Mr. Alderman Hooper was summoned to attend and show cause why, having acted in that capacity, he should not be held liable. Mr. Selwyn, the worthy alderman's counsel, called for the production of a letter, alleged to have contained a consent to act, Alderman Hooper stating that he had no recollection of the circumstances, though he had having paid 75l. towards the debts of the company. It was found that no such letter existed, but another was put in Alderman Hooper's handwriting, in which he "presented his compliments to the secretary, and stated that it was agreeable that his name should be on the provisional committee." Sir H. Webb and Sir Augustus Hilary having disputed their liability, and that they had consented to act as members of the managing committee, documents, under their own hands, were put in as evidence by Mr. H. Harris and Mr. Holland, the official manager, which the Master held to be sufficient to fix them. Messrs. Carr and Studely were unable to say whether, when asked at a previous meeting, they had ever been members of the managing committee; but Mr. Underwood, who had been called as a witness, proved that both gentlemen went to him and requested him to apply to have them made members of the body. They recollected attending meetings, but were unable to say whether they were meetings of the managing committee, though they were aware that the parties attending them were members of that body.

DIRECT LINCOLN AND HULL RAILWAY.—On Friday the winding-up of this company's affairs came before Master Kenderley. Above 16,000 shares were allotted, but the deposit of 2s. was inadequately paid. At the last meeting of the provisional committee the liabilities amounted to 5800l., and the 76 members of that body whose liability appeared to be undoubted were applied to to contribute 77l. each to defray them, but a few only responded. The liabilities now existing, as reported by Mr. Goodchap, official manager, amount to upwards of 2000l., with only 400l. assets that he has had an action against him for the recovery of 1800l., as one of the provisional committee.

DIRECT LINCOLN AND EAST RETFORD.—The petitioners for the winding-up of the company's affairs, before Master Senior, state, that before the allotment of shares took place, the directors intimated publicly that they had at their own expense completed all the plans and sections, and had deposited the same in the most perfect order, so that every standing order, without exception, would be complied with. In reliance on the truth of the statement, shares were taken and deposits paid, but through neglect on the part of some of the plans and sections were such as not to receive parliamentary sanction, and the petitioners allege that there is now in the possession of the directors a large sum of money that ought to be accounted for and refunded.

DIRECT LONDON AND MANCHESTER RAILWAY.—In winding-up the affairs of this undertaking, Master Senior has conducted the examination of Mr. Bass and Mr. Johnson, two of the directors, with closed doors—a proceeding as yet not adopted in any case by any of the other nine Masters.

DUCHIES OF CORNWALL AND LANCASTER.—The motion of Mr. Trevelyan which stood for discussion in the House of Commons, on Thursday evening, was postponed until Monday, on the application of Lord John Russell, in consequence of the unavoidable absence of himself and Sir R. Peel.

A committee on the Mineral Kingdom of the Commission for the Exhibition of 1851, met in the new Palace of Westminster, on Thursday. There were present Sir Charles Lyell, Sir H. T. De la Beche, Sir Roderick I. Murchison, Dr. Lyon Playfair, and Mr. Richard Phillips.

MILTON AND ELSECAR IRON-WORKS.—We are glad to hear accounts of the happy effects produced in the villages of Elsecar, Hoyland, and Stubbing, in consequence of operations having been resumed at the iron-works at Milton and Elsecar, on a very extensive scale, under the enterprising direction of Messrs. W. H. and G. Dawes, the extensive Staffordshire ironmasters. The present animation and bustle are all the more apparent from having been preceded by a dreary season of privation and suffering, consequent on the closing of the works two years ago: 500 houses were built five years ago in Elsecar and Stubbing alone; at present there is not one unoccupied.—Sheffield Times.

Mining Correspondence.

BRITISH MINES.

ALFRED CONSOLS.—The 70 ft. level is driven 2 fms. east of Field's engine-shaft; the lode in the end is 7 ft. wide, and the north part, for about 3 ft. wide, is composed of mundle, spar, and copper ore; the south part is principally capels; the lode, in the same level west, is from 2 to 3 ft. wide—just of the same nature as that of the east. In the 50 ft. level, west of Field's engine-shaft, the lode is about 5 ft. wide, capels, containing a small quantity of copper ore, not of any value; in the 60 ft. level, east of the engine-shaft, the men are breaking about 6 ft. of the north part of the lode, this is nearly all solid copper ore, and worth from 8l. to 10l. per ton; there is still pretty much of the lode standing south, and which part is looking very good. As soon as the north part is driven from 2 to 3 fms. further on, we shall commence taking down the south part of the lode; the part that is now breaking is worth 50l. per ton. The lode in the winze sinking under the 60 ft. level, east of the shaft, is from 4 to 5 ft. wide, and worth about 40l. per ton. We shall commence sinking Wyke's shaft immediately. There is no change in any other part of these mines.

BARRISTOWN.—The 80 fathom level end west, on the new lode, is still poor; the 30 ft. level end east, on this lode, we have suspended for the present, there being scarcely a trace of a lode in it. A winze in the bottom of this level, on this lode, looks well, producing about 7 cwts. of lead per fm., and getting stronger in depth. The 20 ft. level end west, on the east and west lode, is not quite so well for ore as last reported, but the lode is large, containing blende and carbonate of iron, and producing about 3 cwts. lead per fm.; the eastern end, on this lode, looks much the same as last reported, but we will keep up the bottom of the level—the upper part not being so good for ore. We are driving the 26 ft. level end west, on the new lode, to intersect the east and west lode; this end, which is on the new lode, is producing good stones of ore. We expect to ship the lead on Monday.

BEDFORD UNITED.—The lode in the 100 ft. level east remains as last reported, producing from 3 to 4 tons of good ore per fm. We are driving by the side of the lode in the 90 ft. level east. In Bray's winze, in this level, the lode is worth 35l. per fathom. The lode in the 70 ft. level east is from 2 to 3 ft. wide, producing saving work, and altogether a very promising lode.

CARTHEW CONSOLS.—At the upper mine good progress is making in sinking the engine-shaft, which is now down between 3 and 4 fms. below the 55 ft. level; the lode is very large, yielding copper and lead. The lode in the north end, in the 65 ft. level, continues good, and important tribute ground is opening here; the south end, at this level, is yet being continued by the side of the lode (the lode being hard), to get as early as possible under the good lead ground mentioned as opening a head-dyke at the bottom of the 45 ft. level. At the 55 ft. level north we are arrived at a point where the lode is apparently west, and we are clearing a cross-cut thither. Many of the tributers are now engaged in breaking very good work, and I have no doubt our next sampling will be larger than the last. The tradesmen are getting on well with the engine-house, and the founders are making rapid strides with the castings, and every effort will be used to get the winze and crusher in operation at the time mentioned. At the lower mine, in driving the adit level south this week, we have met with a large ledge, which has the lode to the west, but expect to get on its course again in a few days.

COMBLAWN.—The walls of the engine-house are up ready to take the oak that carries the cylinder, and as soon as it arrives, and the wood house fixed, we shall begin to heave in the engine, and which, in about a fortnight, will be in course of erection.

COURT GRANGE.—We are dressing at Pen-y-cefn 16 tons per month, and at Lletten-hen about 5 tons. The prospects at Pen-y-cefn are brightening; the 30 fathom level, east of the engine-shaft, is improved, and has drained the 16 ft. level to the bottom; it is in pretty good ore, and the ore slopes are as good as usual. I hope this will continue, so as to perpetuate and improve the small profits that we are now giving. At Lletten-hen the water has increased so much, that we must immediately make use of the new pumps; the ore is good in sinking, but more particularly in the western end of the shaft. The increase of water is by no means a bad symptom. I hope our next month's work will be completed by the end of the week, and that the men will be ready to work, and, therefore, bring our returns to near 100l. per month; and this will be increased as soon as the engine-shaft is sunk to the 40 ft. level. Our dressing is proceeding satisfactorily, but we shall have to enlarge our slime floorings, but the expense of this will not be very great. I believe it is almost impossible to have a more effectually constructed field of machinery than that belonging to Court Grange.

DEVON AND COURTNEY.—The lode in the end driving west on the gooson lode, in the 40 ft. level, is about 2 feet wide, composed of white iron and killas, mixed with spots of lead ore. In the 50 ft. level, driving east on the south lode, the lode has not been taken this week. The pitches continue to look well.

EAST CROWDALE.—The middle shaft still holds good—lode worth 25l. per fm. In the 28 ft. level east the lode is kindly, but poor. We purpose sampling, on Wednesday next, our January and February tin—say, 13 tons. The tribute pitches are looking fair.

EAST WHEAL GEORGE.—The following report, from Capt. John Pomroy, bears date March 19:—The work is going on well, the shaft being down 10 ft., and timbered to suit. The lobby, in driving to wheel-pit, is completed, which latter is in course of completion; it is a week from this time, so that the men may go to work to wall the pit. The smith's shop and count-house are nearly up, and the contractors are actively employed in raising and loading stones. The road will be completed, soil removed, and banks made by the end of this week. Nine men are employed in sinking the shaft, and I hope we shall be all in course by the time the wheel is up. Capt. Carpenter was over here yesterday, and set the shaft.

The following is the report of Capt. James Carpenter, dated March 21:—The shaftmen have completed their last contract, and we have again set them to sink the shaft to the depth of 12 fms. under the surface, being 10 fms. to sink deeper than the adit; they are also to divide, case, and put in footway from surface to that depth for 60l., by nine men. The wheel-pit will be cleared out by to-morrow evening, ready to commence the walling thereof. The walls are up to receive the roof of the smith's shop and count-house. The castings are ordered for the wheel, and every requisite preparation for getting ready for a erection are put in motion, to bring into action as circumstances may require its aid. Complacency on it no unnecessary time shall be lost to further the object we have in view, and to carry out the operations, whereby our anticipations of having a good and lasting mine may be realised.

The following report, from Mr. H. English, bears date 22d of March:—According to your request, I have visited East Wheal George Mine; but, excepting surface work and arrangements for prosecuting the workings by putting down the shaft 12 fms., and sinking a cross-cut to intersect the lode, nothing has been done which calls for remark. The smith's shop and count-house only require roofing; the dressing floors are laid out; the wheel-pit, I may say, is completed so far as excavation, and the shaft sunk 1 fm. below the adit. I expect that two months will put the shaft down; and, within four or five weeks from that time, the lode will be intersected by a cross-cut in the 12 ft. level, and the wheel in the interim be at work. I have entered into arrangement with Mr. Mare, of Plymouth, for the castings for the wheel, and given orders for the timber work ready for a erection so that no delay shall arise. They will at once commence work with the shaft, and bring the lode home, and from what I have seen, I have no doubt but that the work will be done under the estimate, without the ground should change, or some unforeseen obstacle present itself. An assay of a fair sample, as I am informed, made by a very competent party in Tavistock, gave 29 per cent. for pure copper.

ESGAIR LEE.—We have not cut the counter lode in the deep adit, east of the cross-course, but we are driving north for that purpose. The north lode, in the deep adit, west of Morgan's winze, is still looking promising, and is 4 ft. wide, and will yield about 10 cwts. of ore per fm. The lode in the 12 ft. level, west of Morgan's winze, is looking a little more promising than when last reported, producing good stones of ore, but not sufficient to set a value on; as yet we have not seen the lode at this level, but we will put some men to drive south to cut it; the distance, I think, will be from 2 to 3 fathoms. The counter lode, in the 12 fathom level east from surface, is improved since last reported, and will at present yield full 1 ton of ore per fm. We are now ready for the masons to commence building the wheel-pit.

HEINGSTON DOWN CONSOLS.—The lode in the 35 ft. level, east of the eastern cross-cut, is improved since last reported on, both in size and quality. The ground in the middle cross-cut is much as last reported on. In the western cross-cut we have cut the capels of the lode, and hope, therefore, to report favourably thereon in our next. The winze sinking below this level carries a small leader of ore on the north part of the lode.

HENNOCK.—We put our engine to work in the beginning of last week, and the men commenced working in the engine-shaft on Thursday last. I set the shaft to sink to six miners and three labourers, for the month, at 8l. 8s. per day. I have still men raising some very rich-looking stuff for copper. I shall order to-day about cleaning the gooson we have at surface.

HOLMBUSH.—The lode in the 120 ft. level south is 4 ft. wide, producing about 3 cwts. of lead per fm.; it is pushing in the back of the level is without material alteration. The ground in the 120 ft. level cross-cut south, towards the flap-jack lode, is very favourable, and we are pushing it on as fast as possible. In driving the 110 ft. level cross-cut west from the eastern part of the lead lode, we have intersected the western (or flouken) part of the lode, which is 3 ft. wide, composed of spookan, spar, prlan, and sprigs of lead and mundle, but not worth saving. There is water issuing from the present end, and we purpose extending the cross-cut a little further in that direction, to intersect the western wall of the lode. The flap-jack lode, in the 100 ft. level, east of the great cross-course, is 2 ft. wide, composed of spar, mundle, and stones of copper ore. The men in the back of the level are all earning fair wages in their respective tributes.

KESWICK.—The 17 ft. level rise, at Brandy, is poorer than last week. In the 30 fathom level north there is an improvement since last report; the slope in the 20 ft. level south is rather poorer, but we have commenced driving upon the vein. In the 17 ft. level, the ore is very good indeed. In the 17 fathom sump, on vein, the ore is good, and the ground kindly. There is a strong vein in the 17 ft. level, but it is too wide at present for bearing ore. The bottom level still continues hard and wet.

KIRKCUDBRIGHTSHIRE.—The lode in the 62 end, west of Stewart's shaft, is 3 ft. wide, much improved, and now yields half a ton of lead per fm.; the lode in the 62, east of Keith's, is still barren; in the 62 end west there is a small leader of lead coming in with a fine kindly spar, and an improved lode. The lode in the 80 end west has improved in size, and more water coming in it again.

PENZANCE CONSOLS.—The bottom in the 16 ft. level, on Bayn's lode is a good lode, 3 ft. wide, and rich. The bottom level, on the engine lode, is improved and the tributers are raising a good quantity of tin-stuff; on the middle lode we have a fine branch of tin; on the north lode we are much improved—lode 3 ft. wide, good tin-stuff. We are now raising a good quantity of rich tin-stuff. As we extend our levels and get more tin ground discovered, we shall be able to raise more tin each month.

SOUTH WALES MINES.—There is no alteration in the south, or Frongoch lode, in the shallow level east and west of the old workings, since last reported; and I think it likely, by the end of this month, we shall cut the lode in the cross-cut north 12 fms. below the old workings.

SOUTH WHEAL TRELAWNY.—The engine-shaft is in course of sinking below the 50 fathom level by six men, ground favourable—also composed of a deep blue killas strata. The south cross-cut, east and west of the engine-shaft, at the 50 ft. level, are in course of driving by six men in each cross-cut; the western cross-cut is extended about 5 fms. from the shaft, and is also mixed with silvans and capels, with spots of copper ore and mundle.

RUNNABORD COOMBE.—There is but little hope of the shaft-men completing their bargain in the time allowed—viz., by the 23d—in consequence of the ground being much harder than when I last reported; instead of being able to sink from 2 ft. 6 in., being much harder than when I last reported; instead of being able to sink from 2 ft. 6 in., they have only sunk 2 ft. 8 in. for the last week; however, I hope they will soon get through the hard floor and into better ground again. We are now 7 fms. 4 ft. below the

adit level, and I feel very anxious to get to the 10 fm. level, to see the lode there, believing that we shall have an abundance of tin, both from the main and north lodes. I am glad to hear that the tin has fetched such a price, 54s. 5s. per ton. I only regret that the parcel is so small. The steam-engine continues to work well, and consumes about the same quantity of coals as she has done for the last 3 or 4 weeks, about 7 cwt. per week.

SPEARNE CONSOLS.—The engine-shaft has been in good tin ground for the last 70 fms. striking, but the tin ground is getting larger and richer as we sink; in the 70 fm. level our tin was only 50 fms. long; in the 80, 55 fms., and in the 90 we have extended in good tin for 60 fms., and have still a good lode in the level west; in our 100, 110, and 120 fms. levels, east and west of the engine-shaft, we have good lodes of rich tin-stuff. We have now discovered, at this shaft only, 19,000 lb. worth of tin; this is likely to be a lasting and good paying mine. We have also in the bottom of White's lode a great quantity of good tin ground—should say 4000 lb. worth.

TREAWNY.—At Phillip's shaft, in the 82 fm. level north, the lode is 2 ft. wide, and worth 87. per fm.; in the 85 south the lode is 2 ft. wide, and worth 77. per fm.; in the 72 north the lode is 2 ft. wide, and worth 87. per fm.; in the 72 south the lode is 2 ft. wide, and worth 77. per fm.; in the 62 north the lode is 2 ft. wide, and worth 122. per fm.; in the 52 south the lode is 3 ft. wide, and worth 87. per fm.; in the 72 north the lode is 2 ft. wide, and worth 87. per fm.; in the 72 south the lode is 2 ft. wide, and worth 77. per fm.; in the 40 fm. level, north of Smith's shaft, the lode is 14 ft. wide, and worth 87. per fm. We have holed the winze in the bottom of the 30, which has much improved the air in the 40 end. Our stoves continue much the same.

TRELEIGH CONSOLS.—In the 100 fm. level, west of Garden's shaft, no lode taken down this week. In the 90 fm. level, west of ditto, the lode is 1 ft. wide, with stones of ore, and is looking more kindly. In the 80 fm. level, at the north part, the lode is 10 in. wide, but not much ore. In the 70 fm. level, the lode is 3 ft. wide, and worth 74. per fm. At Wheel Parent the engine-shaft is down 4 fms. below the 40 fm. level south of the lode. In the 40 cross-cut south, towards the middle lode, the ground is moderately good, and the 40 fm. level east the lode is 14 in. wide, with stones of ore. The 30 fm. level east is suspended for the present, in order to sink a winze on the 30 fm. level, where there is a kindly pitch. At the middle lode, in the adit east, the lode is 18 in. wide, with good stones of ore, and is looking kindly.

WEST WHEEL JEWEL.—The 85 fathom level, west of Williams's cross-course, on Wheel Jewel lode, is unproductive. The 70 fm. level, west of Williams's cross-course, on the same lode, is worth 61. per fm. The 57 fm. level, west of Williams's cross-course, on the same lode, not taken down in the past week. The shallow adit stoves, west of Tregoning's shaft, on Tolcarne tin lode, are worth 74. per fm. The deep adit level, west of Tregoning's shaft, on the same lode, not taken down in the past week. The 13 fathom level, west of Tregoning's shaft, on the same lode, is unproductive. The stoves west of Fryer's winze, in the back of the 13 fm. level, on the same lode, are worth 212. per fathom. The stoves east of Tregoning's shaft, in the bottom of the same level, on the same lode, are worth 241. per fm.; the stoves west of Tregoning's winze, in the bottom of the same level, on the same lode, are worth 241. per fm.

WHEEL ANDERTON.—There is a great improvement in our 40 fm. level, west of engine-shaft, which is 60 fms. deep; the lode is producing some rich tin-stuff, and increasing in size and quality as we proceed; this appears to be the shoot of ore we have in the 80, only a few fathoms farther west; therefore, I am pressing on the 60 and 70 fm. levels with all possible dispatch, to prove the result; the latter two levels are not so far west as the 40 and 80; however, the indications are very similar to what they were previous to the discovery in the 40. The pitches are continuing to yield a fair proportion of ore to remunerate the tributers handsomely, at 7s. in 11.

WHEEL GROSE (St. Kew).—Captain N. Faull having been requested to inspect the mine, reports—[My attention was first called to the extent of the set, which is about 600 fms. on the course of the lode. An adit level is taken up and driven on the course of the lode about 40 fms., to a shaft which is sunk 5 fms. All the ground explored on the lode is about 70 fms. There is a great sameness in the lode, its average width about 24 in., impregnated with silver-lead ore throughout—stamps work. I saw a sample assayed by Mr. Jenkins, of Fowey; its produce for silver was 38 ozs. to the ton, and 13 lb. in 20 for lead. There is another lode opened upon about 6 fms. which is a strong gossan lode. This mine is contiguous to that very promising mine, Tregoning, and, no doubt, a continuance of the same lode. The strata is quite congenial to silver-lead, being a light-blue killas, very easy for driving, and inexpensive for timber. The mine carries a beautiful look on the footwall, its underlay about 4 in. in the fm. The mine is situated about two miles from Wadebridge (a branch of the River Camel bounding it on the south), where there is every facility for getting all materials needed for the prosecution of the mine, as well as the shipping of the ore, at a low rate. When I look at the situation of the mine at surface, and the promising appearances of the lode, having so many good indications, I am decidedly in saying I believe it will, if worked with spirit, and in a mining-like manner, shortly prove a profitable and lasting mine. In order to accomplish this, I would strongly recommend that a 40-in. double-acting steam-engine be at once erected, having a stamps attached; by so doing, returns would shortly be made, the adventurers remunerated for their outlay, and no doubt of the mine becoming one of the dividend-paying mines.]

WHEEL LANGFORD.—I wrote you a hasty note last night, which will lead you to expect something good from me to-day; and I know that you will not receive it with great pleasure. I am now prosecuting the lode from the point of departure by Malachy, between Langford and Malachy shaft, we have a very fine copper lode, about 15 in. wide; and Capt. Knott informs me that it increases in size as it goes west. A box, with the samples of the lode, brought up in my presence, you will receive on Monday morning by railway, which will, I think, tend very far to prove that, however sanguine our expectations were, we shall realise them. In the box you will also find some small pieces of yellow ore in paper, which came from a leader, passed through the cross-cut north from Malachy's shaft, which is now extended about 3 fms.; and, according to the regular course of the lode at the departure alluded to, there will be about 3 fms. more to drive; there has been for the last day or two considerable quantities of water coming from the end of the cross-cut, which indicates we are near the lode; the small leader of copper I have noticed is underlying north. The main copper lode is underlying south; and Capt. Knott believes that, when we have driven out the cross-cut to the lode, we shall not only have a fine lode of copper, but a good branch of silver-lead ore, which will be a handsome return for their outlay. In reference to the prospect of raising a large quantity of silver gossan, with lead ore, I cannot help saying it is my real opinion. I have been underground to-day, and find the levels driven as follows:—The 20 fm. level south, 43 fms. ft.; ditto north, 50 fms. ft.; the 30 south, 4 fms.; ditto north, 1 fm. 3 ft. I have also to state, that the 30 fm. level south is changing for the better; I believe we shall have a good mine in a short time. In reference to what quantity of ore we can return per month, it is difficult to say, for the process of dressing must be considerably altered; so I beg to defer making a definite opinion on that subject for a month. The machinery at both shafts keeps the water very completely, and with proper attention I believe it will do so through the summer.

WHEEL LAWRENCE.—I consider we are through the lode west, and the general feature of it is Jack, munda, spar, and fookan, letting down a great quantity of water. I intend to-morrow to put the men to drive east, to cut the eastern part of the lode, which has gone off to the east of the shaft.

WHEEL PENHALE.—The engine-shaft is being sunk from the 30 to the 40 fm. level, under far more pleasing circumstances than those under which any preceding shaft has been sunk here, from the ground being much better, and evidently, from its unmined nature, more congenial to minerals—it is of a beautiful blue killas. In the cross-cut from the north end, 30 fm. level, we have not yet intersected the lode upon which it is anticipated the 20 fm. level will be sunk; but a small lode of silver-lead ore, in the cross-cut, in the south end, 30 fm. level, good work is broken from a deep, dry, or branches, falling into the lode, but not any of the latter (which is apparently very good) has been broken of late, but it is intended to commence doing so early in the coming week. A very good improvement has been met with since last report in the winze at the 10 fm. level north, and the lode continues good in the production of lead and copper; the lode in the end, at this level south, continues increasing in size, but I find no important improvement in its production. Some of the tributers have this day commenced breaking down the lode, and present appearances promise a good yield of ore.

WHEEL SARAH.—From this day's observation, I have great reason to believe that this will make a good mine, if fully tried, and with good management, so as to remunerate the tributers handsomely. I am now prosecuting the lode from the point of departure by Malachy, between Langford and Malachy shaft, we have a very fine copper lode, about 15 in. wide; and Capt. Knott informs me that it increases in size as it goes west. A box, with the samples of the lode, brought up in my presence, you will receive on Monday morning by railway, which will, I think, tend very far to prove that, however sanguine our expectations were, we shall realise them. In the box you will also find some small pieces of yellow ore in paper, which came from a leader, passed through the cross-cut north from Malachy's shaft, which is now extended about 3 fms.; and, according to the regular course of the lode at the departure alluded to, there will be about 3 fms. more to drive; there has been for the last day or two considerable quantities of water coming from the end of the cross-cut, which indicates we are near the lode; the small leader of copper I have noticed is underlying north. The main copper lode is underlying south; and Capt. Knott believes that, when we have driven out the cross-cut to the lode, we shall not only have a fine lode of copper, but a good branch of silver-lead ore, which will be a handsome return for their outlay. In reference to the prospect of raising a large quantity of silver gossan, with lead ore, I cannot help saying it is my real opinion. I have been underground to-day, and find the levels driven as follows:—The 20 fm. level south, 43 fms. ft.; ditto north, 50 fms. ft.; the 30 south, 4 fms.; ditto north, 1 fm. 3 ft. I have also to state, that the 30 fm. level south is changing for the better; I believe we shall have a good mine in a short time. In reference to what quantity of ore we can return per month, it is difficult to say, for the process of dressing must be considerably altered; so I beg to defer making a definite opinion on that subject for a month. The machinery at both shafts keeps the water very completely, and with proper attention I believe it will do so through the summer.

WHEEL TRESCOLL.—Since my last report we have had a great improvement in our 30 fm. level going east; we are now carrying 3 ft. of the lode—good work; how large the lode is we cannot say, as we have not yet seen the leader part of it; but we expect that the north and south part of the lode have met together, as they were split at the engine-shaft; but this we shall not be able to ascertain before we cut the elvan course, from the quantity of water proceeding from it; but we do think we are not far distant, if it take the same underlay as it did at the 10 fathom level. We have begun to sink a winze under the elvan course, on the 20 fm. level, and also lay open a cross-cut in tin gone down this winze will ventilate the 20 fm. level, and also lay open a cross-cut in tin gone down. We hope to cut the C lode, in the south cross-cut, in a few days, as we are continually intersecting branches all containing tin, with a quantity of water proceeding from them to match, so that we were obliged to drop another lift, to assist the one at the bottom, as all the water is falling into that level. We are sinking fast in the flat-roofed, in beautiful soft decomposed ground, and full of branches, going towards the main lode. I hope in six or eight weeks from this time to have this shaft down to the 80, when we shall be able to cut all the lode north and south, and at that depth, which will lay open a vast quantity of valuable tin ground; moreover, I have to state that every day the mine shows a better appearance.

WHEEL VINCENT.—19A.—We have commenced sinking our shaft on the course of the north lode in the moor, the ground in which is very favourable for sinking. 20th.—We have this day taken down the south lode in the engine-shaft, and found it to be much larger as it goes down; and I am happy to state, it is gradually improving in quality. Both our stamps are regular at work night and day.

FOREIGN MINES.

ALTEN MINES.—Estimated produce for January:—

Mines.	Tons of Ore.	Per Cent.	Fine Copper.
Rapais	62	81	5.27
Old Mine	40	6	2.40
United Mines	18	18	0.99
Michell's	20	7	1.40
Carl Johan's	2	7	0.14
Mancour's	1	6	0.06
Total	143		10.26

Mining Report from the 26th January to the 3d February.

Rapais.—The general appearance of the workings on this mine is cheering, although, on the whole, there is now no further improvement to note. In sinking Mosk's shaft, the men have made good progress, and by the end of this month we hope to be able to commence a 30 fm. level, for exploring the lode at this depth. We have passed through some very favourable indications, with occasional veins of good ore, which we hope to find collected and more productive when further explored by the proposed new level. The appearance of the 30 fm. level, on the north lode (Labouchere's), is very promising, and the ore is now sufficient to enable us to commence working on it. The price, however, is at present too little—the men cut down the bargain on the setting day; but we hope some improvement shortly take place, which will enable them to obtain their full earnings, and give them some encouragement. The stoves in the 30 workings are also set on tribute to 12 men, at 56 per ton of 10 per cent. ore; and

with these alterations, we have been able to make a considerable reduction in the number of hands formerly required at the surface for dressing the ore and clearing the ore floors. These men will now be employed in the mine, for exploring the lodes, and doing other necessary work, whilst we are thereby, at the same time, enabled to extend our tribute operations, as shown by the accompanying list of settings. The weather has lately been so boisterous, and the ground has been so much frozen, that it has been impossible for us to make the usual returns to the smelting-house. The floor has also hitherto been completely frozen, and prevented the vessel from reaching the wharf; but to-day, having open water, and more favourable weather, although extremely cold, we commenced driving down the stocks, and hope in a short time to be able to make some good returns.

United Mines.—At this place we have no further change to note: we continue to explore Ward's lode, which yields a small quantity of ore, with favourable prospects, and we do not at present anticipate any further deterioration. In the last discovery, on the main lode, towards the north-east, another branch has been intersected, with good ore and gossan, but in small quantity. Although this change will not immediately augment the usual monthly returns, we must still consider it a great improvement on the prospects we have hitherto had in this part of the mine. No alteration is to be noted in the adit level, where the ground is hard, but favourable for driving. Some of the tribute pitches have been rather more fluctuating, but, on the whole, there has been no falling off, neither are the prospects in any way deteriorated.

Michell's.—The lode in the new sink, to the westward, has latterly shown signs of improvement, and the ore is becoming rather more plentiful, but we continue to work here at this season of the year under great disadvantages. There are two small promising lodes, about 1 ft. apart, but trending towards each other, and on their point of intersection they hold out great hopes of an important improvement. The tribute pitches have yielded the usual returns, without any visible change in the contents of the several lodes, as well as the workings continued with regularity.

Carl Johan's.—This lode has latterly deteriorated, and the returns have, in consequence, experienced a material reduction; we have, however, every reason to hope that this falling off will prove but temporary, having before been subject to fluctuations of the same kind, which, on further trial, have invariably been found succeeded by improvements attended with highly favourable results. We shall continue exploring this lode, and hope the next report will advise you of better success. **Mancour's** has also been very poor, and the tribute returns have been comparatively trifling. We have now very little outlay at this mine, and expect the returns will be sufficient to cover the cost. Our present workings are confined to a slope in the old shaft, under the adit level; and, without an improvement takes place in the ensuing two months, further exploration in the mine will be suspended; and we hope, about that time, to be able to find more remunerative work for employing the men at the surface. The severity of the weather, and the great quantity of snow fallen, have offered many impediments to our usual ore delivery at the end of the month, but with next post we hope to hand you a satisfactory note of our returns to the smelting-house. The worst part of the winter has now passed, and on the return of the sun to this part of the globe, we again look forward to an early spring, when we expect our usual summer operations will be attended with their former good success.

AUSTRALIAN MINING COMPANY.—November 2.

Produce of Tungkill.—Total quantity of ore, supposed to yield 26 per cent. produce, sent to Port Adelaide from the commencement, 400 tons; on the mine, ready for carting, Nov. 2, 100; lying on the mine, now being extracted, 115—680 tons, supposed above 26 per cent.; remaining on the floors and in the mine, available for colonial smelting, 710—1390 tons, raised from the commencement.

Monthly Report of Tungkill.

In the past month, six men have been stopping in the back of the 40, south from Kendall's winze on the side lode, in which place the ore is much mixed up with iron—consequently, not many tons of best ore have been got out from these stoves; the men are now, however, directed to work northward from Kendall's winze, where the ore is of high per centage; in the line under the cross-cut, a change is commencing from carbonate and oxide to pyrites; and the lode contains a great quantity of gossan, which promises well for the 50. The cross-cut in the 50 is now commenced to cut into the side lode in the level, and the ground there is not so hard as was anticipated when compared with the hardness of Masterman's shaft; 1 fm. can be driven per week, so that we may reasonably expect to see the lode there in five or six weeks. As we advance towards the side lode, a gradual increase of water is taking place; I do not, however, anticipate that our horse-power will be very much increased entering the lode.

Baker's lode in the 40, north of Phillip's winze is promising, but not producing any ore at present; the ground is, however, favourable, and further discoveries may be reasonably expected. A rise in the back of the 40, on side lode, is commenced against a new winze below the 30, which I hope to complete from 30 to 40 fathoms by Jan. 1, 1850, and by means of which more miners will be employed to stop the ore ground. The sinking of Masterman's shaft having drained the stoves below the 40, we have employed a great number of men, and other costly expenses attending the erection of the 48-in. steam-engine over Anstey's shaft; it is my intention to draw upon you on account of this shipment, to the extent of 107. per ton, and, consequently, the bank will make insurance at 111. per ton, and you will be pleased to effect such further insurance as you may deem proper. Mr. Newman, the port agent, has just called with a memorandum of the quantity of ore at port on the 17th inst.—viz., 152 tons of 21 cwt.

Produce of Tungkill Mines from commencement up to Dec. 7.—Total quantity of 21 cwt., supposed to yield 26 per cent., sent to Port Adelaide from the commencement, 545; now lying on the mine ready for cartage—say, 20; not yet finished dressing—say, 80; lying on the mine, in course of being extracted, 700 tons; remaining on the floors, supposed to yield from 10 to 12 per cent. of copper, 750—total raised, 1495 tons.

Monthly Report.

In making out my monthly report of these mines, I commence with the new shaft, on Baker's lode, which is now about 41 fms. below the surface; and although the ground is becoming somewhat harder than usual, and more than was anticipated at such a depth, yet it is a work that must be proceeded with, if not for the purpose of drawing ore and rubbish to surface, which will be most economical when the railway goes beyond a certain length; but for ventilation this shaft is indispensable; for, at the present time, the ventilation in the north lode is not so good as it should be, and we find ourselves at a loss to draw air into other parts of the mine the thermometer ranges from 60 to 75, in that end it usually is at 90; in the 40, north from Phillip's winze, the lode is spotted with ore, and contains generally a considerable quantity of green carbonate, much disseminated; and, in the last fortnight, the ground has become much softer than usual, so that we have now let the driving of 5 fms. at 54. per fm.; and, although this level has been comparatively unproductive, yet I do not despair of some day having the pleasure to report a good lode of ore in it. In the 50 fm. level we have driven 4 fms. westward, and have 2 fms. more to go, in which appears to be a good lode, and we have some few spots of yellow ore, which confirms a doubt we have some time felt, that the large side lode in the 40 has joined with Baker's lode, somewhere between the 40 and 60. We have now directed the men to turn and drive eastward; and we expect that we shall cut into Baker's lode some time in December month. In the month of February, 1849, our stoping below the 40, north from Masterman's shaft, was suspended, having reached the water, and from which place we raised some quantity of ore, containing much native silver, and which was the best we have ever raised; and as the ground is so soft, we have now directed the men to turn and drive eastward; and we expect that we shall cut into Baker's lode some time in December month. In the month of February, 1849, our stoping below the 40, north from Masterman's shaft, was suspended, having reached the water, and from which place we raised some quantity of ore, containing much native silver, and which was the best we have ever raised; and as the ground is so soft, we have now directed the men to turn and drive eastward; and we expect that we shall cut into Baker's lode some time in December month. In the month of February, 1849, our stoping below the 40, north from Masterman's shaft, was suspended, having reached the water, and from which place we raised some quantity of ore, containing much native silver, and which was the best we have ever raised; and as the ground is so soft, we have now directed the men to turn and drive eastward; and we expect that we shall cut into Baker's lode some time in December month. In the month of February, 1849, our stoping below the 40, north from Masterman's shaft, was suspended, having reached the water, and from which place we raised some quantity of ore, containing much native silver, and which was the best we have ever raised; and as the ground is so soft, we have now directed the men to turn and drive eastward; and we expect that we shall cut into Baker's lode some time in December month. In the month of February, 1849, our stoping below the 40, north from Masterman's shaft, was suspended, having reached the water, and from which place we raised some quantity of ore, containing much native silver, and which was the best we have ever raised; and as the ground is so soft, we have now directed the men to turn and drive eastward; and we expect that we shall cut into Baker's lode some time in December month. In the month of February, 1849, our stoping below the 40, north from Masterman's shaft, was suspended, having reached the water, and from which place we raised some quantity of ore, containing much native silver, and which was the best we have ever raised; and as the ground is so soft, we have now directed the men to turn and drive eastward; and we expect that we shall cut into Baker's lode some time in December month. In the month of February, 1849, our stoping below the 40, north from Masterman's shaft, was suspended, having reached the water, and from which place we raised some quantity of ore, containing much native silver, and which was the best we have ever raised; and as the ground is so soft, we have now directed the men to turn and drive eastward; and we expect that we shall cut into Baker's lode some time in December month. In the month of February, 1849, our stoping below the 40, north from Masterman's shaft, was suspended, having reached the water, and from which place we raised some quantity of ore, containing much native silver, and which was the best we have ever raised; and as the ground is so soft, we have now directed the men to turn and drive eastward; and we expect that we shall cut into Baker's lode some time in December month. In the month of February, 1849, our stoping below the 40, north from Masterman's shaft, was suspended, having reached the water, and from which place we raised some quantity of ore, containing much native silver, and which was the best we have ever raised; and as the ground is so soft, we have now directed the men to turn and drive eastward; and we expect that we shall cut into Baker's lode some time in December month. In the month of February, 1849, our stoping below the 40, north from Masterman's shaft, was suspended, having reached the water, and from which place we raised some quantity of ore, containing much native silver, and which was the best we have ever raised; and as the ground is so soft, we have now directed the men to turn and drive eastward; and we expect that we shall cut into Baker's lode some time in December month. In the month of February, 1849, our stoping below the 40, north from Masterman's shaft, was suspended, having reached the water, and from which place we raised some quantity of ore, containing much native silver, and which was the best we have ever raised; and as the ground is so soft, we have now directed the men to turn and drive eastward; and we expect that we shall cut into Baker's lode some time in December month. In the month of February, 1849, our stoping below the 40, north from Masterman's shaft, was suspended, having reached the water, and from which place we raised some quantity of ore, containing much native silver, and which was the best we have ever raised; and as the ground is so soft, we have now directed the men to turn and drive eastward; and we expect that we shall cut into Baker's lode some time in December month. In the month of February, 1849, our stoping below the 40, north from Masterman's shaft, was suspended, having reached the water, and from which place we raised some quantity of ore, containing much native silver, and which was the best we have ever raised; and as the ground is so soft, we have now directed the men to turn and drive eastward; and we expect that we shall cut into Baker's lode some time in December month. In the month of February, 1849, our stoping below the 40, north from Masterman's shaft, was suspended, having reached the water, and from which place we raised some quantity of ore, containing much native silver, and which was the best we have ever raised; and as the ground is so soft, we have now directed the men to turn and drive eastward; and we expect that we shall cut into Baker's lode some time in December month. In the month of February, 1849, our stoping below the 40, north from Masterman's shaft, was suspended, having reached the water, and from which place we raised some quantity of ore, containing much native silver, and which was the best we have ever raised; and as the ground is so soft, we have now directed the men to turn and drive eastward; and we expect that we shall cut into Baker's lode some time in December month. In the month of February, 1849, our stoping below the 40, north from Masterman's shaft, was suspended, having reached the water, and from which place we raised some quantity of ore, containing much native silver, and which was the best we have ever raised; and as the ground is so soft, we have now directed the men to turn and drive eastward; and we expect that we shall cut into Baker's lode some time in December month. In the month of February, 1849, our stoping below the 40, north from Masterman's shaft, was suspended, having reached the water, and from which place we raised some quantity of ore, containing much native silver, and which was the best we have ever raised; and as the ground is so soft, we have now directed the men to turn and drive eastward; and we expect that we shall cut into Baker's lode some time in December month. In the month of February, 1849, our stoping below the 40, north from Masterman's shaft, was suspended, having reached the water, and from which place we raised some quantity of ore, containing much native silver, and which was the best we have ever raised; and as the ground is so soft, we have now directed the men to turn and drive eastward; and we expect that we shall cut into Baker's lode some time in December month. In the month of February, 1849, our stoping below the 40, north from Masterman's shaft, was suspended, having reached the water, and from which place we raised some quantity of ore, containing much native silver, and which was the best we have ever raised; and as the ground is so soft, we have now directed the men to turn and drive eastward; and we expect that we shall cut into Baker's lode some time in December month. In the month of February, 1849, our stoping below the 40, north from Masterman's shaft, was suspended, having reached the water, and from which place we raised some quantity of ore, containing much native silver, and which was the best we have ever raised; and as the ground is so soft, we have now directed the men to turn and drive eastward; and we expect that we shall cut into Baker's lode some time in December month. In the month of February, 1849, our stoping below the 40, north from Masterman's shaft, was suspended, having reached the water, and from which place we raised some quantity of ore, containing much native silver, and which was the best we have ever raised; and as the ground is so soft, we have now directed the men to turn and drive eastward; and we expect that we shall cut into Baker's lode some time in December month. In the month of February, 1849, our stoping below the 40, north from Masterman's shaft, was suspended, having reached the water, and from which place we raised some quantity of ore, containing much native silver, and which was the best we have ever raised; and as the ground is so soft, we have now directed the men to turn and drive eastward; and we expect that we shall cut into Baker's lode some time in December month. In the month of February, 1849, our stoping below the 40, north from Masterman's shaft, was suspended, having reached the water, and from which place we raised some quantity of ore, containing much native silver, and which was the best we have ever raised; and as the ground is so soft, we have now directed the men to turn and drive eastward; and we expect that we shall cut into Baker's lode some time in December month. In the month of February, 1849, our stoping below the 40, north from Masterman's shaft, was suspended, having reached the water, and from which place we raised some quantity of ore, containing much native silver, and which was the best we have ever raised; and as the ground is so soft, we have now directed the men to turn and drive eastward; and we expect that we shall cut into Baker's lode some time in December month. In the month of February, 1849, our stoping below the 40, north from Masterman's shaft, was suspended, having reached the water, and from which place we raised some quantity of ore, containing much native silver, and which was the best we have ever raised; and as the ground is so soft, we have now directed the men to turn and drive eastward; and we expect that we shall cut into Baker's lode some time in December month. In the month of February, 1849, our stoping below the 40, north from Masterman's shaft, was suspended, having reached the water, and from which place we raised some quantity of ore, containing much native silver, and which was the best we have ever raised; and as the ground is so soft, we have now directed the men to turn and drive eastward; and we expect that we shall cut into Baker's lode some time in December month. In the month of February, 1849, our stoping below the 40, north from Masterman's shaft, was suspended, having reached the water, and from which place we raised some quantity of ore, containing much native silver, and which was the best we have ever raised; and as the ground is so soft, we have now directed the men to turn and drive eastward; and we expect that we shall cut into Baker's lode some time in December month. In the month of February, 1849, our stoping below the 40, north from Masterman's shaft, was suspended, having reached the water, and from which place we raised some quantity of ore, containing much native silver, and which was the best we have ever raised; and as the ground is so soft, we have now directed the men to turn and drive eastward; and we expect that we shall cut into Baker's lode some time in December month. In the month of February, 1849, our stoping below the 40, north from Masterman's shaft, was suspended, having reached the water, and from which place we raised some quantity of ore, containing much native silver, and which was the best we have ever raised; and as the ground is so soft, we have now directed the men to turn and drive eastward; and we expect that we shall cut into Baker's lode some time in December month. In the month of February, 1849, our stoping below the 40, north from Masterman's shaft, was suspended, having reached the water, and from which place we raised some quantity of ore, containing much native silver, and which was the best we have ever raised; and as the ground is so soft, we have now directed the men to turn and drive eastward; and we expect that we shall cut into Baker's lode some time in December month. In the month of February, 1849, our stoping below the 40, north from Masterman's shaft, was suspended, having reached the water, and from which place we raised some quantity of ore, containing much native silver, and which was the best we have ever raised; and as the ground is so soft, we have now directed the men to turn and drive eastward; and we expect that we shall cut into Baker's lode some time in December month. In the month of February, 1849, our stoping below the 40, north from Masterman's shaft, was suspended, having reached the water, and from which place we raised some quantity of ore, containing much native silver, and which was the best we have ever raised; and as the ground is so soft, we have now directed the men to turn and drive eastward; and we expect that we shall cut into Baker's lode some time in December month. In the month of February, 1849, our stoping below the 40, north from Masterman's shaft, was suspended, having reached the water, and from which place we raised some quantity of ore, containing much native silver, and which was the best we have ever raised; and as the ground is so soft, we have now directed the men to turn and drive eastward; and we expect that we shall cut into Baker's lode some time in December month. In the month of February, 1849, our stoping below the 40, north from Masterman's shaft, was suspended, having reached the water, and from which place we raised some quantity of ore, containing much native silver, and which was the best we have ever raised; and as the ground is so soft, we have now directed the men to turn and drive eastward; and we expect that we shall cut into Baker's lode some time in December month. In the month of February, 1849, our stoping below the 40, north from Masterman's shaft, was suspended, having reached the water, and from which place we raised some quantity of ore, containing much native silver, and which was the best we have ever raised; and as the ground is so soft, we have now directed the men to turn and drive eastward; and we expect that we shall cut into Baker's lode some time in December month. In the month of February, 1849, our stoping below the 40, north from Masterman's shaft, was suspended, having reached the water, and from which place we raised some quantity of ore, containing much native silver, and which was the best we have ever raised; and as the ground is so soft, we have now directed the men to turn and drive eastward; and we expect that we shall cut into Baker's lode some time in December month. In the month of February, 1849, our stoping below the 40, north from Masterman's shaft, was suspended, having reached the water, and from which place we raised some quantity of ore, containing much native silver, and which was the best we have ever raised; and as the ground is so soft, we have now directed the men to turn and drive eastward; and we expect that we shall cut into Baker's lode some time in December month. In the month of February, 1849, our stoping below the 40, north from Masterman's shaft, was suspended, having reached the water, and from which place we raised some quantity of ore, containing much native silver, and which was the best we have ever raised; and as the ground is so soft, we have now directed the men to turn and drive eastward; and we expect that we shall cut into Baker's lode some time in December month. In the month of February, 1849, our stoping below the 40, north from Masterman's shaft, was suspended, having reached the water, and from which place we raised some quantity of ore, containing much native silver, and which was the best we have ever raised; and as the ground is so soft, we have now directed the men to turn and drive eastward; and we expect that we shall cut into Baker's lode some time in December month. In the month of February, 1849, our stoping below the 40, north from Masterman's shaft, was suspended, having reached the water, and from which place we raised some quantity of ore, containing much native silver, and which was the best we have ever raised; and as the ground is so soft, we have now directed the men to turn and drive eastward; and we expect that we shall cut into Baker's lode some time in December month. In the month of February, 1849, our stoping below the 40, north from Masterman's shaft, was suspended, having reached the water, and from which place we raised some quantity of ore, containing much native silver, and which was the best we have ever raised; and as the ground is so soft, we have now directed the men to turn and drive eastward; and we expect that we shall cut into Baker's lode some time in December month. In the month of February, 1849, our stoping below the 40, north from Masterman's shaft, was suspended, having reached the water, and from which place we raised some quantity of ore, containing much native silver, and which was the best we have ever raised; and as the ground is so soft, we have now directed the men to turn and drive eastward; and we expect that we shall cut into Baker's lode some time in December month. In the month of February, 1849, our stoping below the 40, north from Masterman's shaft, was suspended, having reached the water, and from which place we raised some quantity of ore, containing much native silver, and which was the best we have ever raised; and as the ground is so soft, we have now directed the men to turn and drive eastward; and we expect that we shall cut into Baker's lode some time in December month. In the month of February, 1849, our stoping below the 40, north from Masterman's shaft, was suspended, having reached the water, and from which place we raised some quantity of ore, containing much native silver, and which was the best we have ever raised; and as the ground is so soft, we have now directed the men to turn and drive eastward; and we expect that we shall cut into Baker's lode some time in December month. In the month of February, 1849, our stoping below the 40, north from Masterman's shaft, was suspended, having reached the water, and from which place we raised some quantity of ore, containing much native silver, and which was the best we have ever raised; and as the ground is so soft, we have now directed the men to turn and drive eastward; and we expect that we shall cut into Baker's lode some time in December month. In the month of February, 1849, our stoping below the 40, north from Masterman's shaft, was suspended, having reached the water, and from which place we raised some quantity of ore, containing much native silver, and which was the best we have ever raised; and as the ground is so soft, we have now directed the men to turn and drive eastward; and we expect that we shall cut into Baker's lode some time in December month. In the month of February, 1849, our stoping below the 40, north from Masterman's shaft, was suspended, having reached the water, and from which place we raised some quantity of ore, containing much native silver, and which was the best we have ever raised; and as the ground is so soft, we have now directed the men to turn and drive eastward; and we expect that we shall cut into Baker's lode some time in December month. In the month of February, 1849, our stoping below the 40, north from Masterman's shaft, was suspended, having reached the water, and from which place we raised some quantity of ore, containing much native silver, and which was the best we have ever raised; and as the ground is so soft, we have now directed the men to turn and drive eastward; and we expect that we shall cut into Baker's lode some time in December month. In the month of February, 1849, our stoping below the 40, north from Masterman's shaft, was suspended, having reached the water, and from which place we raised some quantity of ore, containing much native silver, and which was the best we have ever

ton 15.—Snapethorpe 15.—Sidney's Hartley 15.—West Hartley 15.—Ships, 124 ; sold, 67.

SILVER-LEAD ORE.

THAMES TUNNEL COMPANY
number of passengers who passed through the Tunnel in the week ending March 16,
was—No. of passengers, 19,113. —Amount of money, £79 12s. 9d.

NOTICES TO CORRESPONDENTS.

* * We must impress upon our correspondents, the necessity of furnishing us with their names and addresses—not that their communications should, consequently, be noticed, but as an earnest to us of their good faith.

"E. E." (Manchester).—A letter, addressed to our office, will be forwarded to the parties from whom we obtained the quotation—Pine lead, 19s. 10s. per ton, free on board.

Mr. H. Poole (Albion Mines, Nova Scotia) writes on the subject of the aneroid barometer, in which communication, he informs us, he generally keeps his "in the case, on its back, by the side of a common barometer, and its readings vary from 4 to 8 hundredths of an inch lower than the mercurial barometer; if suspended by the ring, 25 hundredths of an inch lower than when lying in the case; and when turned upside down, or lying on its face, it reads a full tenth less than the mercurial barometer." We have not had any great experience with the aneroid; but it appears to us that a difference of 0.04 in, during the range of a season, is small, and probably may arise from eccentricity in the centre, which should be allowed for; as also for temperature, as is usual with the best mercurial barometers. The difference of its reading between the horizontal and vertical positions being 0.025, we also think but trifling; but, whatever the difference, it should be observed, and allowed for when necessary. We have had considerable correspondence on this subject; but we believe Mr. Vidi, in the first instance, never had an idea of holding it out as a scientific instrument; he only desired to supersede that unworthy and unscientific instrument, the wheel barometer, and has not only completely succeeded, but the aneroid has been found to possess properties of much greater value than was at first suspected by its inventor; and, as it is impossible to foresee whether it may not receive important improvements, we should be sorry to see a germ of science cradled in the very bud.

"A. B." (Holywell).—"An Act of Parliament, said to have been passed in some former reign, offers a reward of 20,000*l.* for the discovery of the area or space contained in a circle without a fractional remainder. Has such Act ever been passed, and when? Is any such Act now in force, and where is to be met with?"

Alfred Conzola.—In a notice of this mine, in our City Article last week, it was stated that a call had been made of 20*s.* per share; it should have been 10*s.*, as correctly stated in the report of the meeting. The call, we may observe, would not effect permanent holders; but to be paid only on those shares about to be transferred.

"J. D." (near Manchester).—"We have made enquiries of a practical mechanical engineer acquainted with such machines, who has never heard of one capable of registering the weight and number of carts, as required by our correspondent. Weigh bridges, as hitherto constructed, have been on the principle of the steel-yard, and in these the inherent necessity of shifting the weight would render registration difficult. On other principles—the spiral spring, for instance, there would be no difficulty in constructing a correct and self-registering apparatus."

"A Secretary" (Great Street).—The adventures of Great Wheel Alfred disburied 80,000*l.* to unwater the mine, and put it into working order; it was not about the mine until after Mr. John Taylor had called in a number of agents, who unanimously reported that the mine could not at that period be advantageously worked to pay costs. The Alfred Consols now at work are almost within a stone's throw of the Great Wheel Alfred. The ores obtained were sulphurets.

We have received a further communication from our correspondent Mr. Motley, on the Tabular Bridges, which shall appear in our next publication. Mr. M. has also promised, in addition to his splendid model alluded to, another model of the inflexible suspension plan, and also one of his plan of under suspension, which we shall with pleasure permit to be inspected at our office by any who may be desirous of seeing them.

R. M. Clinton (Rathfriland).—The patent spiral buffer springs may be obtained on application to Mr. J. Brown, Atlas Steel Works, Sheffield.

"Miner" (Redruth).—"The gold mine of Beresof is situated three leagues north-east of Ekaterinbourg, at the foot of the Ural Mountains, on the Asiatic side. It is famous for the chromate of lead, discovered there in 1776, and worked in the following years, also for some rare varieties of minerals. The ore of Beresof is a cavernous hydrate of iron (bog ore), presenting here and there some small strata of hepatic iron, and occasionally some pyrites. It contains 5 parts of native gold in 100,000. This deposit appears to have a great analogy with the deposits of iron ore of the same region. It constitutes a large vein, running from north to south, enclosed in a formation of gneiss, hornblende, schist, and serpentine, which does not appear to dip to any considerable depth. It becomes poor in proportion to its distance from the surface. The explosion, which is in the open air, has been carried on since the year 1776. The gold is extracted from the ore by stamping and washing. In 1786, 500 marks were collected; but in the preceding years it was much smaller. Beds of chromate of iron have also been discovered in these mountains. The beautiful plates of mica, known in mineral collections under the name of Muscovy tale, come from the Ural. The explorations for them are carried on near the Lake Ichebarkool, on the eastern flank of the Ural chain. Twenty-five leagues north of Ekaterinbourg, near the town of Mourinsk, there occur numerous veins, containing several varieties of beryl, topaz, emerald, and amethyst, in granitic granite."

Ralph Scurfield (Sunderland).—Coal has been found in so many places on the coast of the Middle Island of New Zealand, or New Munster, that the existence of some important coal fields seems to be very probable. Two of the places in which coal is stated to have been most abundant, are in the vicinity of Massey Bay and of Otage; but in the hills near Wanganui, on the west coast of North Island, or New Ulster, one very thick bed has been seen. In Van Diemen's Land two deposits of coal have been discovered—the South Eak lagoon, supposed to agree in character with the Newcastle Basin of New South Wales, and the Jerusalem Basin, not far from Hobart Town on the east, which is said to afford anthracite. In addition to these, the governor reported, in a despatch dated 6th November, 1848, that excellent coal was said to have been discovered at Schouten Island, on the east coast of Van Diemen's Land.

WAT POLGOOTH.—In our office of last week the report of this company was inserted under the heading of Wheal May—the mistake arose through both reports coming from one office, without being properly distinguished.

* * It is particularly requested that all communications may be addressed—

TO THE EDITOR,
Mining Journal Office,
26, FLEET-STREET, LONDON.

And Post-office orders made payable to Wm. Salmon Mansell, as acting for the proprietors.

THE MINING JOURNAL

Railway and Commercial Gazette.

LONDON, MARCH 23, 1850.

The MINING JOURNAL is published at about Eleven o'clock on Saturday morning, at the office, 26, Fleet-street, and can be obtained, before Twelve, of all newsagents, at the Royal Exchange, and other parts of London.

The grand banquet at the Mansion House on Thursday evening last, given by the LORD MAYOR as a commemoration, or introduction, to the forthcoming great Exhibition of the Industry of all Nations, in 1851, was never surpassed in splendour, or importance, by any previous gathering within its walls. The civility and hospitality was not, on this occasion, displayed as congratulatory of some blood-stained victory, obtained at the cost of the lives and treasure of the country, and the tears and groans of the widow and the fatherless; nor was it one of those passing pageants which gladden the giddy and the vain, as each festive season makes its annual round. Far higher were its objects; this meeting was called together as anticipatory of a forthcoming event, which will tend to unite nations in the bonds of amity and peace, to develop to the fullest extent the ingenuity and capabilities of the human mind; and to hasten that time when men "shall beat their swords into ploughshares, and their spears into pruning hooks." To ascertain the general feelings of the country towards the proposed exhibition, by uniting in one spot, and on one occasion, representatives from every town, and of every interest; and most satisfactorily was the appeal of the LORD MAYOR responded to. There were presented to PRINCE ALBERT, at a levee held by him 122 Mayors and other civic dignitaries of English towns, the Lords Provost of Edinburgh, Glasgow, and Perth, with seven Provosts of other towns in Scotland; and from Ireland, the Lord Mayor of Dublin, and the Mayors of Belfast, Cork, Limerick, and Waterford. PRINCE ALBERT's suite consisted of the Archbishop of Canterbury, Marquises of Lansdowne and Salisbury, Lords Palmerston, Carlisle, Grey, and Clifden; Bishop of London, Sirs J. GRAHAM, G. GREY, Colonels C.B. PHIPPS, and C. GREY. W. E. GLADSTONE, Esq., M.P., and Colonel BOUVERIE, Groom in Waiting. There were present also the principal of the foreign Ministers, the commissioners for conducting the exhibition, the aldermen, masters of city companies, chairmen of committees of Common Council, with representatives from the Universities, East India Company, Bank of England, and other public bodies. The Egyptian Hall was magnificently fitted up for the occasion, and contained emblems for every district, among which shone conspicuously the mining counties of Cornwall, Devon, Northumberland, Durham, Derby, York, &c.

The health of PRINCE ALBERT, and success to the Exhibition of 1851, was drunk with much enthusiasm, and his Royal Highness in reply observed, that it was highly gratifying to find that his suggestion had met with such universal concurrence and approbation; he considered it the duty of every educated man to watch the requirements of the age in which he lived, and to use his individual exertions to further those requirements; no one could doubt for a moment that we were living in a period of wonderful transition, tending rapidly to the accomplishment of that great end to which all history points, the realization of the unity of mankind. The distances which separate nations on the surface of the globe were gradually vanishing before the achievements of science; the acquirement of the languages of all nations are placed within the reach of all, and thought is communicated to distant places with the rapidity of lightning. The great principle of the division of labour, which may be called the moving power of civilization, was being extended to every branch of science, industry, and art; while formerly discovery was wrapt in secrecy, now no sooner was one made than it was surpassed by competing efforts. The Exhibition of 1851 was to give a true

test, and a living picture, of the point of development at which the whole of mankind had arrived, and new starting point from which all nations will be able to direct their further exertions. The Prince spoke highly to the purpose, and his observations were received with much satisfaction.

Among the usual and numerous toasts which were given, was one of a somewhat novel character at meetings of the wealthy and great; but highly appropriate on the present occasion; it was "the working men of the United Kingdom," given by the Earl of CARLISLE, who said there was not one person present, from the prince to the magistrate of the smallest town in the realm, but whose comforts, luxuries, even necessities, and life itself, was not promoted and sustained by the strength of sinew, skill of hand, and resources of the brain, which constitute the wonder-working industry of Britain.

The French ambassador called the meeting the House of Commons of British industry; and it was highly pleasing to hear clergy and laymen, peers and commoners, men of the army and navy, merchants and tradesmen, all united in one common, one holy cause—that of advancing the social happiness of the human race, and of promoting the comfort and prosperity of all classes of society.

In another column will be found a summary of the discussion which took place on Mr. EVAN HOPKINS's paper, on the "Structure of the Crystalline Rocks of the Andes," at the Geological Society, on the 13th inst., which we published in our last. Notwithstanding the rapid advances which geology has made as a science in the last quarter of a century, every observer who feels himself interested in this sublime science, must notice that there still exists a vast deal of misconception in the nature of those changes which are continually, slowly, but surely, and obedient to established laws, taking place in the primary rocks. We find many professing to know something of geology, speaking of granite, or other rocks, in a state of incandescence, or liquification, from igneous action, and blindly following the Huttonian theory, without a single fact on which to support their inferences. Hitherto in no single instance of underground research has any discovery, confirmatory of igneous action, been made. Heat and moisture, generally in connection with metallic bases, generating electric currents, appear to be the instruments with which Nature works in her mineralogical laboratory. Mr. HOPKINS has boldly struck out of the beaten path; and, following the existing laws of Nature, bases his theory of geology on observed facts, in connection with electro-magnetism, with which we fully concur, and which, however they may be contradicted, cannot be refuted. It is from discussions such as these that great natural truths are brought to light; and we are glad to see Mr. HOPKINS's paper so well received, and the discussion carried on with such spirit. We would call particular attention to the latter, and to communications from Mr. DUMARESCU and others on the same subject, in another column.

In the MINING JOURNAL of Saturday last we inserted a table of returns of deaths and injuries from accidents in mines and collieries, during the year 1849, which, however, must only be taken as approximate to the actual number, there being no really official returns, and the owners and viewers of collieries taking every precaution in their power to hush up and prevent the publicity of these afflictive calamities. From this return, however, there appears no less than 567 violent deaths, of which 312, or upwards of three-fifths, were from explosions of carburetted hydrogen. Before last Saturday's paper had received the impress of these returns, which were then in type, the neighbourhood of Wigan was again alarmed by another of those catastrophes, which spread such weeping and lamentation among our colliery population, a notice of which will be found among the accidents, in another column. By this explosion, 13 human beings were hurried into eternity, and probably from 30 to 40 more, as widows and orphans, left to poverty and despair. As usual, no clue can be obtained to the direct cause of the accident, more than that the gas could be smelt, and the men worked with naked candles, nor does it appear that the jury made any particular investigation as to the state of the workings, the nature of the ventilation, or the quantity of air coursed through the workings. The explosion took place—they have evidence sufficient to come to such conclusion; the men are blackened and mutilated corpses; their eyes testify to that fact; and, consequently, a simple verdict is returned, just equivalent to "accidental death."

We had hoped, on the appointment of Messrs. BLACKWELL and PHILLIPS, as inspectors, to have had, ere this, some report from them as to the general state of the collieries in the districts to which they were appointed. Nine months have now passed away; and, as far as the public are aware, we are not in the slightest degree in advance as to improvement in ventilation and working of collieries, or that these inspectors have yet spent a day in the fulfilment of their duties. The Select Committee in the House of Lords, appointed last session, have gone through the thrice repeated farce of examining a host of witnesses; they have issued a voluminous report, and there the matter rests; and we suppose will rest until a second Haswell explosion rings in their ears, and compels the Government again to make some show of a stir, again to relapse into inactivity. In answer to Mr. WILD, however, Sir GEORGE GREY has stated that he expects the report of the inspectors shortly.

It is, however, pleasing to notice any departure from this *laissez faire* system, which, like the oasis in the desert, occasionally gladdens our senses—we allude to a case, in another column, in which a widow, named WALKER, after three years' litigation, recovered from the defendants (Messrs. RUSSELL and BLEITH) 200*l.* for herself, and 50*l.* for each of her children—the jury finding that her husband had met his death in the defendants' collieries through the neglect of their agents; and, in another case—that of G. WHITEHURST, who was killed by a sudden eruption of hot metal at the Golden Dale Iron-Works, near Tunstall, the property of Messrs. WILLIAMSON—PETER JONES, the overlooker, acknowledged that the furnace was worked with coal instead of coke; that the tuyères were dangerous, being made of cast-iron; and that it was not improbable such another accident might happen the next day. The jury in this case found a verdict of "accidental death;" but the coroner cautioned JONES that, as he now went to work with his mind fully informed of the dangers pending in the works, if he did not inform his employer, and get the enormity amended, should another death ensue, it was most probably the verdict would be one of "manslaughter" at least. There can be little doubt but that in the eye of the law, if a thorough investigation took place, many cases would assume a very serious character of manslaughter; and a few such sentences, and the accompanying punishment, would go far to lessen the number of these deplorable calamities.

The last series of accounts which have reached this country from the gold region, which the United States took as a *spoila opima* out of the hands of enfeebled Mexico, are more reasonable in their statements, and more natural in their tone, than those more extravagant narratives of sudden success, and of immense wealth, which preceded them. Although it is now certain that success does not attend all who are diligent, nor riches reward all who are persevering, yet enough is known to satisfy whoever is not determined to disbelieve that the Sacramento is the true Pactolus, and that, in this instance, again, the poets have proved themselves the prophets of mankind. When the placers come to be worked in an orderly and disciplined manner, their gold, in all probability, will be materially increased; but up to this date the produce of all the searchings is not supposed to exceed 1,500,000*l.*, which, spread over a period of two years, and divided among 3000 participants, which is probably less than the number who have troubled the waters of that region, and split its secondary rocks for the sake of the treasures they cover, would give gold to the amount of no more than 500*l.* to each as the remuneration for the time they have spent, the toils they have endured, and the health and life which, in numerous cases, has been grievously injured or wholly sacrificed. The beauty of HELEN was said to be some compensation for the sacking of Troy; but for the loss of character and health, and life itself, too frequently connected with these diggings, the gold which remains to those who survive the perils connected with winning it, is the most vain and vanishing equivalent that could be devised. We have a better Sacramento at home, calling for a far more limited outlay, and insuring a more settled and permanent remuneration. It is not necessary to call particular attention to the mines of the west of England; for, by the quotations which from week to week mark their shares, they tell their own story, and furnish their own recommendation; but it is quite in our power to lay our

finger upon a little chain of mines in Cornwall in which the value of the 5*l.* shares has risen, within the current 12 months, to 120*l.*, and shares of a higher original value to a higher premium still; there is, therefore, not the least occasion to traverse two oceans, or to pierce an almost impervious continent, to seek an increase of this world's comforts so universally desired; for all reasonable wishes of that kind, may, in general, and their proper food and aliment within the four corners of this teeming island.

In the Journal of Feb. 9, we inserted a petition, which was in course of signature in South Wales, intended for presentation to Lord JOHN RUSSELL, praying for the establishment of a mining school; a number of these petitions are being prepared in all the mining districts—Durham, Newcastle, Yorkshire, Derbyshire, Staffordshire, and Lancashire; and we are happy in being able to announce, that Mr. ROBERT HUNT, of the Museum of Economic Geology, has lately been in Cornwall, with the view of ascertaining the general feeling of mineral landowners, mine proprietors, and agents, with reference to the institution of an establishment for the instruction of young men intended for the mining profession in geology, metallurgy, chemistry, assaying, and practical mining engineering. The success has been very far more encouraging than the results which followed Sir CHARLES LEMON's munificent offer some few years since would have led us to expect, and the following memorial is, we are informed, in course of signature:—

TO THE RIGHT HONOURABLE LORD JOHN RUSSELL, THE FIRST LORD COMMISSIONER OF HER MAJESTY'S TREASURY, &c.

We, the undersigned, landowners, mineral proprietors, mine agents, and merchants and manufacturers, immediately interested in the mines and mining industry of the counties of Cornwall and Devon, respectfully memorialize your Lordship, stating that these counties produce annually upwards of 150,000 tons of copper ore—equal to nearly 15,000 tons of fine copper. The tin raised from the mines, and the stream works of this district, amounts to more than 10,500 tons; and are producing upwards of 7000 tons of lead, yielding nearly 150,000 ozs. of silver. Rich iron ores to the extent of 60,000 tons a year have been supplied to the coal districts of South Wales, and the north of England. Zinc, manganese, and many other metalliferous ores, are raised in these counties, and the production of arsenic and sulphur is very considerable. The process of working these mines, and of rendering the ore fit for the market, furnishes employment for at least 30,000 men, women, and children, in Cornwall alone; and, beyond this number, a large body of men are employed in our granite districts, particularly in the preparation of the china-clay for the potteries. The engineering skill required, both in the construction of large and very costly engines used for draining the mines, raising and dressing the ore, &c., and also in the actual working of them, demand much scientific knowledge, mechanical skill, and practical care.

As the successful prosecution of mining operations and metalliferous works depends on habits of careful observation and scientific skill, it is of the utmost importance that those to whom their management is intrusted, should have every facility afforded them for acquiring such a knowledge of engineering, practical mechanics, mineralogy, chemistry, physics, geology, &c., as will fit them for the efficient discharge of the important duties which they are intrusted. The want of such a system of education has been long felt; and it appears to us to be the desirable object of the Government should endeavour to supply to the intelligent miner the means of acquiring that scientific knowledge of which the mine agents and engineers of these counties so fully estimate the value. We may also venture to assume that, with the increase of a knowledge of mineralogy and chemistry, many improvements would be made in metallurgical processes, in the arts and manufactures, which are not now employed. Hence we might look forward to a considerable addition to the wealth of the kingdom by a proper direction of its mining industry. Your memorialists, understanding that the Museum of Practical Geology in London is, in many respects, peculiarly fitted for the purposes of carrying out a general system of mining education, take the liberty to suggest that that establishment might be rendered applicable to this very important purpose; and your memorialists respectfully pray your Lordship to take the subject of this memorial into your consideration, so that such measures as your Lordship may deem expedient towards the foundation of an institution for public mining education in this kingdom may be devised.

The new building, constructed for the Museum of Economic Geology, is exceedingly well adapted for the commencement, at least, of this much to be desired institution; and as this Museum and the Geological Survey Department, both under the direction of Sir HENRY DE LA BECHE, contains a body of gentlemen highly qualified for teachers in the several branches of science, an addition of a comparatively few to complete the ranks would be all that would be required; and we have no doubt that, once in operation, it will form a nucleus, from which branches would spring out into all the large towns in the mining districts. We shall anxiously watch the progress of these cheering symptoms, and shortly return to the subject.

While the serious attention of the public mind has of late been drawn to the colony of Natal as one of the most desirable of her MAJESTY's colonial possessions, the promoters of the NATAL COMPANY have deemed it a fit time to lay before the public their plan of operations. On reading the prospectus which lays before us, we find that the company is about to be established "for the purpose of promoting emigration, for the acquisition and sale of land, and for the encouragement of the cultivation of cotton," &c. At a public meeting, held at the Albion Tavern, on Monday evening, the 11th inst., Mr. CHRISTOPHER, the promoter of the company, who has resided for some time at Natal, explained to the meeting the numerous advantages which the colony of Natal held out to the intending emigrant, and which were not possessed by any of our other colonies. The climate, it appears, is one of the finest and most salubrious in the world. The difficulties which present themselves in Australia, and other colonies, and which are almost insuperable (we mean particularly in reference to long-continued drought), are not met with in Natal, as the country is intersected with numerous rivers, whose waters, to use the words of Sir HARRY SMITH, "never fail." The soil is capable of producing two, and, in some cases, three crops in the year; and hitherto it has not been the practice to manure the land. The success attending the cultivation of cotton appears certain, though it does not appear to have yet been embarked in on a scale to supply, in any quantity, the British market; but as this is a question of the most vital importance to England, and it is now perfectly clear, by the testimony of parties in Manchester and Liverpool, well able to judge of the matter, that Natal cotton is equal to the best American. Judging from the samples already sent home, we presume that the attention of some of our leading capitalists will be drawn to the subject, and that within the next three years we may look for a supply of cotton from Natal, that may make a sensible difference on the American and Indian markets.

The mineral resources of the colony seem also to be very abundant, and require only capital to develop them. Mr. CHRISTOPHER stated that iron, coal, copper, and plumbago had been extensively found in the colony; we have no doubt, therefore, that ere long mining operations on an extensive scale will be carried on. The advantages to be derived by emigration to this new colony are, to our minds, so apparent, that it only seems extraordinary that the tide of emigration had not set in this channel long ago, as while thousands during the last five years have been seeking their fortune in Australia, a country only half-way thither, and far exceeding in fertility and salubrity anything that the former could in its most favoured parts offer, has almost been entirely overlooked. We heartily wish the Natal Company every success, and when they have somewhat farther advanced in their arrangements, we will revert to the subject again.

We were slightly grieved, but scarcely surprised, at the brisk attack made by the *Cornwall Gazette*, a short time since, on the corporation and public of Falmouth. We knew indeed that, whenever that Journal took the whip to its neighbours, it did, drummer-like, lay about them with an exemplary and edifying vivacity. It will not condescend to that softer and more soothing method of reproof, which leaves no scar behind; when it curses (and the occasions it finds for doing so are tolerably numerous), it curses with the energy of Sir BALAM. In the present instance, however, it has vastly overshot its mark, and its arrows are likely to return to its own bosom. The irregularities charged upon the town of Falmouth, and the inattention imputed to the corporation, are points on which the *Gazette* has been trifled with and deceived. They have no foundation in fact; and, if they had, we are quite certain that no alertness of the magistracy, or the police of that borough, could have prevented what is so severely condemned. The Editor knows that irregularities and midnight disturbances have taken place in the borough which he illuminates by his teaching, and within bow shot, too, of his own chair, which there was not skill nor activity enough in the corporation of Truro to prevent; and that in every place many offensive things may both be done and said, of which all the lamps and lanterns of a city will not enable him to discover the utterers or the doers. In many things the magistrate must trust to the moral tone, to the sense of propriety of the people, for those results which can be arrived at by no other means. For these less trivial evils of society, where they exist, the Editor has a great, an organic remedy. Break up the municipal constitution of Falmouth as it stands, he cries, and extend the co-

porate franchise to the district roundabout—that is, excite in the neighbourhood something equivalent to a storm to wait a few feathers, or to drown a few flies. The people of that district, however, have a deal too much common sense—to much discernment—to desire, as we believe, anything so preposterous. Great occasions certainly might call for so great a change; but to think of it as against the imaginary irregularities which fill the mind of the *Gazette*, is, of all things, impertinent and superfluous. The things alleged against the magistrates and the people of Falmouth, we repeat it, are unfounded and untrue; and they have a just right to complain that their conduct has been set out in false and discreditable colours by one from whom they were entitled to expect a truer representation, and who, if he troubled himself with their affairs at all, should have embodied a statement far more level with the actual circumstances of the case.

THE ELECTRIC LIGHT.

We have received the specification of Messrs. Stait and Petrie, for their improvements in electric light, which is of great length, and inscribed in the usual verbose style of all Chancery documents. We cannot, of course, inflict on our readers the task of wading through this sea of words, to discover the nature of the several claims, of which there are 15; but shall endeavour to render the plans understood by a simple description, as a summary of the whole.—1. The invention consists of improved hydrobarometers, the use of which is to place them in the individual battery cells, so that the liquid supplied to each cell shall drop first into the instrument, and thence into the liquid in the cell, whereby the relative specific gravities of the liquids can be discerned by inspection, and it can then be known whether any cell is becoming more exhausted than the others, or whether any of them are receiving an undue share of liquid.—2. The invention consists of a flexible enclosed capillary syphon, to be used with galvanic batteries; it may be made with lamp wick, woollen material, asbestos, hair, wire, &c., enclosed in a tube of vulcanised caoutchouc, which, being waterproof, protects the material from injury from water, or most dilute acids. This capillary syphon is used to draw the liquids slowly from the upper or lower part of a cell, and another similar syphon can be used to replenish the same. The peculiarity of this syphon is, that it can take liquid from any depth the lower orifice is placed in, without taking any from above, as ordinary capillary syphons do, nor does it wet the sides of the vessel over which it passes.—3. For the protection of galvanic apparatus, they are sulphurised by a process, which is applicable to most metallic articles, and even to wood, and some other materials. The article is heated to a degree to freely melt the sulphur; a roll of sulphur is then rubbed slowly over its surface, until the whole is dripping wet with melted sulphur. If it be desired to give a thin coat only, the sulphur is wiped off with tow, or scraped off with an edge of wood; but if a thick coat is required, the article is slowly turned about in all directions, until the sulphur has begun to solidify upon it. When cold, the sulphur will form a hard and compact coating, not so easily chipped off as ordinary cements. This process is exceedingly useful to protect the exterior of cast-iron batteries from chemical action, and for wood, or iron vessels or channels, for holding or conveying nitric acid. 4. The invention has relation to the change of the specific gravity of the solution, which becomes heavier by the action of the battery, to effect the removal of the exhausted or heavy part to give a fresh supply in its place. By this improvement there is no necessity for a great bulk of undiluted fluid, the cells may be very compact, and a greater number of cells in a separate trough.—5. The invention consists of a negative supply apparatus by gravitation, used for supplying and withdrawing from batteries such liquids as become specifically lighter by working, especially that class of liquids which may be renovated; by dissolving in them a fresh supply of their solid material, such as sulphate of copper.—6. Treats of a self-clearing capillary tube syphon, made of glass, for transferring liquids to or from the cells, and as an air bubble at times enters such ordinary syphons, and thereby causes an interruption to their regular action; these are made trumpet-mouthed, gradually widening until the lower end is one-third or one-fourth of an inch internal diameter.—7. An improved method of using saline solutions. The patentees prefer hydrochloric acid of ammonia, or nitrate of potash, next the positive plate, which should be of zinc, and sulphate of copper and copper for the negative solution and plate; a diaphragm is placed between, to separate the liquids, of a material which will allow of being soaked. A two fluid battery of this kind is less proportionally reduced in power than a single fluid one, which is not generally known, and by the closer approximation of the positive and negative elements, greater power is obtained.—8. The invention consists of an improved concentric cell, for the above-named closer approximation of the elements.—9. An improved arrangement of a series of cells.—10. The invention consists of certain improvements in the treatment of iridium, and the manufacture of articles in iridium, the first being a novel method of fusing the metal, by laying it on a bed of its own powder, and passing a powerful current of galvanism through it; the fused iridium is then worked up into a cylindrical form, 2 inches long, one-fifth of an inch diameter, terminating in a blunt point, and forms an electrode, which is fixed in a holder of brass, to which the negative wire and a holder of wood is attached.—11. An improved self-acting Rheostat, called by the patentees an equaliser.—12. A compensating dial balance galvanometer.—13. A differential galvanometer, the object of which is to show separately both the quantity and intensity of the electric current, without having two separate instruments, and without the necessity of greatly interrupting the current.—14. The employment of a chain and barrel, in place of a rack and pinion, for supporting and imparting motion to the electrode shaft in certain electric lamps, and thus keeping them at the required distance from each other, as they wear away.—15. An improved electric lamp movement having relation more particularly to such as have one carbon electrode pushed up to the other, as one wears away.

FRENCH MANUFACTURES.—A tea urn of a very handsome description, being elaborately wrought in solid silver, and believed to be of the value of 1000*l.*, has been imported into this country by a steamer from France. It is understood that this superb specimen of French workmanship is destined for public exhibition, in a collection at present accessible in the metropolis, for the purpose of especially exhibiting specimens of French manufacture. This is one of the first importations of the kind as a specimen.

WHITE GUNPOWDER.—In our last Journal we recorded the discovery of a new kind of gunpowder, invented lately at Constantinople, a communication respecting which had been forwarded to the Swansea Literary and Scientific Institution. At a recent meeting of the society, Mr. Jenkins submitted to trial small quantities of it. Its peculiarities, as differing from common gunpowder, appear to be increased power, quicker ignition, explosion by percussion, and no smell. The residue from the quantities exploded appeared greater than from ordinary gunpowder, but whether this is attributable to its recent preparation, or to any property in the powder, is a question to be decided.

CONTRACTS FOR COALS.—The Lords of the Admiralty will, on Thursday next the 28th inst., receive tenders for supplying the Victualling Yard, Deptford, with 600 tons of Welsh coal; also the Royal Marine Barracks and Infirmary at Woolwich, Chatham, Portsmouth, and Plymouth, with what they may require monthly; and on the 2d of April, for 5200 tons, for the service of the mail steam packets.

RAILWAYS IN SPAIN.—The lines of railway which have been conceded to the existing companies are being carried out with the greatest activity, and the decree of the Cortes has caused a great demand for iron and machinery. Numerous lines are projected for next year, and not only has a wide field been thus opened for English metals and manufactures, but the mining interest in Spain has received a satisfactory stimulus.

RAILWAY THROUGH THE ALPS.—M. Mans, the Sardinian engineer, has published his report on the gigantic operation of boring through the Alps in constructing the railway from Chambéry to Turin. The tunnel will be finished in five years, and the expense, including the laying down of a double line of rails, will, according to his estimate, amount to 13,000,000*fr.* If the calculations of this gentleman are exact, the work will be executed for a much smaller sum than was estimated by the French engineers, who calculated the cost of boring the Saint Irenée mountain at 24,000,000*fr.*

COMMUNICATION WITH SIR J. FRANKLIN.—Specimens of printed slips of satin paper, of various colours, suggested by Mr. G. Shepherd to be distributed over the country in the North, in hopes of catching the attention of the wanderers, was exhibited on the library table of the Royal Society on Thursday evening, after the reading of the usual paper. This novel mode of distributing messages in the Arctic regions was greatly admired by all the members present.

ROYAL POLYTECHNIC INSTITUTION.—The lectures by Sir Henry Bishop, on the secular music of England, still continues to draw crowded audiences to the establishment. The numerous popular airs of our native composers, from the time of Purcell to the present day, are commented upon, and illustrated by the Misses Thornton and Young. We understand that during the Lent week, sacred music, from Handel and others, will form the subject of Sir Henry's discourse, aided by an increased number of vocalists.

Original Correspondence.

VOLTAIC COPPER ASSAY.

Sir,—I had hoped that Mr. Roberts, or some other person, would have replied to Mr. J. Prideaux's letter on the assay of copper by voltaic action, which appeared in the *Mining Journal* of the 19th Jan.; but I fear that no one has yet attained such proficiency in his process as "to re-dissolve and re-precipitate a given weight of copper half-a-dozen times, without an ultimate loss of more than $\frac{1}{2}$ per cent., or impairing the quality of the metal;" nor am I aware that either Mr. Roberts, or any of his followers, can insure success in every single experiment. Nearly all the assays that I have made produced as much fine copper as could be brought out in the dry way, but I have been unable to precipitate the whole of the metal. The following process, however, which I have lately adopted, leaves but a trace of copper in solution, and a more expert manipulator might, by the same means, be able to reduce the whole of the metal; 100 grains of finely-powdered ore was digested in dilute nitric acid, until there was no further action. The solution had distilled water added, and, after subsidence, was decanted, the powder washed, and the washing added to the solution. The solution was evaporated to one-half, and decanted into a pot, made as pipe-clay, with a plate of the same material, $\frac{1}{2}$ inch in thickness running across it. These pots can be made of any shape, or thickness; I need not say that the outside part must be glazed previously to baking. The clean sheet of copper having been carefully weighed, was connected, in the usual way, with a plate of zinc, and both plates placed in the pot—one each side of the porous division, and not more than $\frac{1}{4}$ in. from it. The apparatus was placed on a sand bath, and the copper precipitated produced 29 $\frac{1}{2}$ per cent. As a test to the above, 1 oz. of boiling hydrochloric acid was poured on a duplicate sample of 100 grains, and nitric acid added by drops, until no further action took place; 1 drachm of sulphuric acid was added, and the whole evaporated to dryness. Boiling distilled water was poured on the mass, the solution filtered, and the copper, precipitated by a sheet of zinc, produced 29 $\frac{1}{2}$ per cent.; the produce by the dry way was 29 $\frac{1}{2}$ per cent. fine. Where great accuracy is not required, I have digested the ore in the galvanic pot, adding hot water, and setting the apparatus at work as before, without even decanting, or filtering the solution, and thus an assay might be made at one-third the usual time required. There is yet another and a better way of analyzing copper—a modification of Pelouze's method, which I have adopted with great success. It is the most expeditious, and, at the same time, the most accurate method with which I am acquainted. The process shall be described in detail in an early Number of the *Mining Journal*. JOHN PRIDEAUX.

Wheat Adams, March 21.

UNION FAN AND PISTON AIR-ENGINE.

Sir,—Allow me to offer a few considerations on a high-pressure fan-blast engine patented in my favour, in Belgium, and on its application to blast-furnaces and other purposes. I shall feel obliged by your submitting them to the appreciation of your readers. Let us first consider the ventilating fan machines used in the industrial arts, either for the fusion of cast-iron in cupola furnaces, for the ventilation of mines, or for other purposes. I shall only allude to those which displace the air by revolving on their axes with great rapidity. Some of these act by centrifugal force, drawing the air in near their centre, and expelling it at the circumference; they vary principally in the form of the vanes. Other ventilators displace the air by a translatory movement; among these may be placed the Archimedean screw ventilator, and the mill-vane ventilator of M. Lesoinne. The most complete description of all of these may be found in Mr. Trautner's work on mine ventilators. When the required effect can be obtained by means of fans, they are always preferred to piston-engines, because their first cost is much smaller, and because there is much greater regularity in their action. Their use, however, is limited, on account of the feeble pressure, or suction, they are capable of producing; this effect is mainly attributable to two causes—one of these consists in that, by the means of bands, or cog-wheels, a rapidity of rotatory motion above certain limits cannot be given to the fans; the other fault is that depending on the method of construction of fan ventilators, by which the air is obliged to make its exit on side, under a certain pressure, entering in a neighbouring part of the machine. The air is, besides, in general, subjected to a considerable whirling motion, and to often repeated shocks.

My object in projecting a new ventilator, was to bring a remedy to these defects, rendering it in many respects a more perfect instrument than those hitherto employed. I shall here give a concise description of my system. On one and the same axis I unite a fan ventilator and a re-acting engine. The steam enters at one extremity of the axis, whence it traverses a curved tube, from which it issues in a tangential direction to the rotatory movement. This re-acting tube is solidly fixed to the axis, by means of a disc, composed of two plates of sheet-iron, rivetted together, and enclosing between them the re-acting tube. The steam, on issuing from the engine, is carried off by a chimney into the atmosphere. All who are acquainted with re-acting engines are aware that they can revolve with a much greater rapidity than is correspondent to any pressure of air required in the industrial arts. If, through the excellence of the construction, the motive-power has but little friction to overcome, it is not difficult to prove by calculation that re-acting engines can furnish a very considerable proportion of useful power, when all the conditions requisite for securing regularity of working are united, and when the occurrences of repeated shocks, whirling, and changes of direction in the air are avoided. The opening between the vanes must be in proportion to the volume of air which it is required to displace, and to the rapidity with which it is required to pass through the vanes; in most fans, this space is too considerable. When the ventilator displaces air by a translatory movement, there must be the smallest possible difference between the radii of the openings between the vanes. The air must never be forced suddenly to change its direction entirely; it should be guided at its centres to, and on its axis from, the rotatory apparatus. By fulfilling these conditions, a pressure of air, corresponding to the rapidity of rotation, may always be obtained.

As a metallurgist, this question principally interested me as regards the application to blast-furnaces. Over piston-engines, they would have the advantage of giving a more regular current of air, without the use of regulators; it would also be easy to regulate the admission of steam by the pressure of air for the blast-furnace.

One use of these machines (which possibly may prove of some interest at a future period) is the application to aerial navigation; for the purpose of directing balloons in the air, it would be necessary to dispose of very powerful machines, whose action should be employed in moving, with great rapidity, ventilators, whose action in the air would be of a nature analogous to that of the Archimedean screw in the water. One primary condition would be well fulfilled, as with a weight not exceeding 2 cwt. a ventilator might be united on a balloon, with a motive force of about 20-horse power. The question to be considered is what substance may be used for producing the motive-power. Steam cannot be thought of, the weight of matter required for its production being too considerable. Ether, or chloroform, condensed in the air, at their exit from the machine, might be used; or electro-magnetic machines; or, perhaps, gun-cotton, acting by a regular series of explosions, would be more likely to answer the purpose. I hope that the ideas contained in this communication may be the means of opening a new path for labours on this subject.

Seraing, Liege, March 16.

A. J. RICHARD,
Ingénieur Metallurgiste.

GASES FROM THE BLAST-FURNACE.

Sir,—In answer to Mr. David Mushet's letter of the 5th March, I have to observe that the best method of collecting and bringing down the gas is that in use at the iron-works of Le Creusot, and described in the letter of Mr. Montefiore Levi, in the *Mining Journal* of March 9. There is sufficient gas coming from the furnace to keep up the steam after the engine has stopped for about two hours; but, if it stops much longer, the steam must be got up with coal under one boiler. I have worked three months without using 1 lb. of coal for the boilers. JOHN WHILE.

Aberystwyth Iron-Works, Pontypool, Monmouthshire, March 19.

IMPROVEMENTS IN THE PUDDLING-FURNACE.

Sir,—I wrote to you last week a short account of the progress of Mr. Reuben Plant's patent, and in the same paper in which that letter is inserted, I observe one signed "Oniseau du Paradise," offering to give Mr. Plant and Mr. B. Thompson, or any intelligent inquirer into the matter, information relating to the use of steam in puddling-furnaces. His knowledge in puddling I shall have great pleasure in seeing displayed in the columns of your *Journal*—having no doubt, residing, as he does, at "such an important school as Downla," he is much more proficient in that than the signature as above, copied from your paper, would lead us to suppose

he is in French orthography. He tells us that the "reason why the steam-furnace was given up at the Blaina Works, was because there did not seem to be any particular feeling on the part of the leading men to continue the system." Are we to suppose that these leading men wished their employers success? If so, can we for a moment suppose, that the steam-furnace was a saving to their employer?—certainly not; or they never would have wished to abandon it. On this occasion, I shall repeat what I have previously stated, that Mr. Plant's combination of blast and steam preparatory chamber, and other arrangements, are such as must ultimately end in producing very extraordinary results in the iron trade. I dare say the ironmasters of the old school will consider Mr. Plant in the character of an intruder, and instead of appreciating and fostering his talent and exertions in bringing this important invention to bear, would willingly crush them.—A. CONSTANT READER: Dudley, March 20.

MANUFACTURE OF IRON.

Sir,—Mr. Leighton has mistaken my apology for prolonging this discussion. I never promise to say no more. I think it argues a confession of weakness, and would be besides, on my part, a rash vow, as I am noted for an obstinate disposition, which will never leave what I have once put my hand to, so long as there is a stone remaining unturned. It is quite true I said that cinder, or glass of iron, would be formed by fusing pure oxide of iron, without earthy matter, and more especially without carbon; but I have nowhere denied the presence of earthy matter in the cinder of the ordinary processes; on the contrary, I have distinguished in what degree it becomes unavoidably combined, increasing or diminishing by accident its proportion to the essential component, oxide of iron "generated and fused by the high temperature." The presence of carbon in the cinder is the point I have denied; it is on this only that Mr. Leighton and myself are at issue.

The admission of so large a quantity of coke, or saw-dust, makes, I think, my supposition impregnable; it will envelope itself immediately in an atmosphere which defies combustion. I should like to see it proved, that a smith could work a piece of red-hot iron, until he cured it of this defect, by Mr. Leighton's hypothesis. I have had no object whatever in this discussion but to establish what I believed to be correct principles. I am the last person in the world to do, or say, anything to discourage invention or research; and if my remarks have tended to prejudice any of Mr. Leighton's plans, no one would regret it more; but I think the assertion of truth demands to be always paramount to every other consideration. It by no means follows, if Mr. Leighton is in error in his theory of carbo-oxide, but that his plans may be full of solid and practical advantage. If his results are good, they may defy the theory. I have already had occasion to remark, that all arts and manufactures—and that of iron-making to the full as much as any—have been nursed and brought to maturity merely by a shrewd attention to practical effects, and, in most cases, in utter ignorance and misapprehension as to the true theory of the processes. I do not say this in disparagement of correct scientific theory—wonderful improvements always result from ascertaining it; I merely state the fact, that practice ordinarily far precedes the theory, and a fortunate and providential arrangement it is. For how many centuries since the days of Noah have good wine and beer been made, yet in utter ignorance of the theory of fermentation; so much so, that it is only within a very few years that the German chemists believe they have detected what are the real transformations of this chemical change. The controversy between Berzelius and Sir Humphry Davy, on the nature of chlorine, in no way diminished the practical virtues and efficacy of its acid; so, to compare great things with small, our difference of opinion respecting carbo-oxide may be no hindrance to Mr. Leighton's introducing (which I believe there is scope for) very valuable practical improvements in the manufacture of iron. DAVID MUSHET.

EXPLOSIONS IN COLLIERIES—GOVERNMENT RESPONSIBILITY.

Sir,—Lancashire has again been the scene of two appalling explosions, whereby 16 human beings have been immolated. That at St. Helen's has been of a most furious nature, from the scorched and mangled state of the bodies. It is admitted that a great quantity of gas was accumulated, and that some of the people were working with lamps, and some with candles; and then the jury say, that "it accidentally took fire," and no more about it. What an awful responsibility! The whole mass of evidence, taken upon the oaths of experienced persons from all parts of the country, unites in declaring that much of the loss of life may be saved; and yet "wait a while" is the cuckoo cry. Is it the cursory examination of Messrs. Phillips and Blackwell that is to negative such a mass of facts?—who are just led by the nose to visit select collieries. In short, if they are to visit all the districts before reporting, we may bid adieu to all legislation for the next few sessions. Oh! who that has ever seen the wretched effects of such disasters can bear to hear and see the weepings and lamentations of mothers, widows, and children, left without protectors, and exposed to the ruthless scoffs of heartless parish officers? How can we reconcile this reluctance to any principle of justice, or right feeling? Let us trust that the legislators of the country will no longer mock the complaints and entreaties of the poor miners, but at once lend their countenance to some system of inspection, calculated alike to protect life, and to advance the intelligence of the mining classes of the people.—SCRUTATOR: March 21.

CORONERS' INQUESTS ON DEATHS IN MINES—No. IV.

Sir,—The cases which have been adduced sufficiently prove that instances of incapacity properly to discharge the important functions of the office are by no means uncommon; and, were the proceedings of coroners' inquests more often reported and scrutinized by the public press, we should more frequently hear of similar incompetency in these officials. Of the 567 violent deaths which, according to the valuable information contained in your last Journal, occurred in the mines during the last year, only four or five of them have been deemed of sufficient public interest to entitle the proceedings of the inquests to a record in the columns of the newspapers. It is an old saying, that we may judge of the tree by the fruit it yields; but it is to be feared that this "ancient institution" will scarcely bear being submitted to such a test. Otherwise, we surely should have heard that, in some of these 560 cases of sudden death, there were some at least in which "proper caution" had not been used, and that they were not all ascribed to accident; for it was recently proved by the concurrent testimony of 50 witnesses, before a committee of the House of Lords, that, in many mines, even the most ordinary precautions against explosions, and other calamitous occurrences, were notoriously neglected.

This is the unanimous opinion, given under the obligation of an oath, of parties whose scientific knowledge and practical experience is unquestionable, and many of whom are either the owners or managers of collieries. And, although it was admitted that some improvement had taken place during the last 15 years, yet it was stated by those well qualified and disinterested witnesses, that the loss of life might be very considerably diminished were known precautionary means invariably resorted to; yet, notwithstanding the unvaried purport of the evidence indubitably proves this fact, coroners' juries have averred by their verdicts, that the 560 deaths which have occurred during the past year have been owing to uncontrollable causes, and they have not, in a single instance, returned a criminality verdict. In some, it may be in many, of these cases, it is probable that the parties to whose care the lives of these poor men were entrusted were not guilty of such culpable negligence as to render them legally responsible for their deaths; yet it is impossible to believe in the justice of the majority of the verdicts, or to reconcile them with truth.

It would not be fair, however, to ascribe all this surprising unanimity in the verdicts of juries to the coroners, although there is no doubt but that, in many instances, improper persons are elected to that office, and that some change, by which a power of selection would be conferred is absolutely necessary; for, however well qualified a coroner may be, by his legal knowledge, general intelligence, habits, and temper, efficiently to discharge his duties, it is perhaps unreasonable to expect that he should be well versed in mining operations, or possess extensive information on those scientific subjects which are essential to the true development of the facts in evidence. Without the advantages of a brief, or other competent assistance, he has frequently to contend with the whole engineering staff of a large establishment, whose interest it is to exculpate themselves and the owners, and whose evidence, naturally enough is biased by their feelings. It generally happens too that the workmen are reluctant witnesses, as they are afraid of injuring the owners, or losing their employment if they state all they know.

To supply this deficiency of engineering knowledge in the coroner, and to prevent the continuance of the evils resulting from it, it is to be hoped that Government will introduce a clause in the proposed bill for the ap-



THE MINING JOURNAL.

position of inspectors of mines, which will render the presence of the inspectors obligatory at all inquests which are held in consequence of fatal accidents in mines, to assist the coroner in his investigations. By such an arrangement, the legal attainments of the coroner would be re-enforced by the scientific knowledge and practical experience of the inspector, and the public would thus have an additional guarantee for the efficiency of the investigations, and the due administration of the law.

However ably and well the presiding officer may conduct the proceedings of these courts, it is not in his power, nor is it his duty, to compel juries to "give a true verdict according to the evidence," and it is but fair to presume that the verdicts returned are often at variance with his views of the evidence and knowledge of the law. Such occurrences sometimes happen in the courts at Westminster, and are, perhaps, inseparable from a trial by jury; but, granting the possibility of many cases being thus determined, the difficulty of accounting for the universal practice now in vogue, of always acquitting the parties implicated, may be principally ascribed to other causes. The present mode of constituting the jury is capable of great improvement. On extraordinary occasions some care is often shown to select intelligent persons, but in those inquests which are almost of daily occurrence, it usually happens that the jury is composed of ignorant men, who are incapable of appreciating the important duties which are imposed on them. In some instances the deceased's fellow-workmen are impanelled, and in one case the officer who summoned the jurors not only called upon the men employed in the colliery in which the accident occurred to serve, but actually constituted the overman as foreman! Fortunately the attention of the public was directed to this case, and another jury was impanelled. The intelligent and able coroner for East Glamorgan, in his evidence to the Children's Employment Commission, says—"In mining districts the workmen formed the juries, and, as a matter of course, none could be found to return verdicts, or levy deadwages, by which their employers would be injured. He had many times been obliged to take a jury from Cardiff into the country, as the people were so ignorant and so prejudiced, that it was almost impossible to persuade them to return proper verdicts." The remedy thus resorted to was not only very judicious, but perfectly legal; for it is stated in "the books" the coroner "must sit at the very place where the death happened, and this inquiry is made by a jury from four, five, or six of the neighbouring towns, over whom he is to preside." This wholesome provision of the law has been long neglected and unobserved, owing, probably, to the additional inconvenience and expense which it imposed; but it is worth serious consideration, whether it is not expedient to recur to it, and whether the advantages which would most probably result from its revived observance would not more than compensate for the little additional trouble it might occasion.

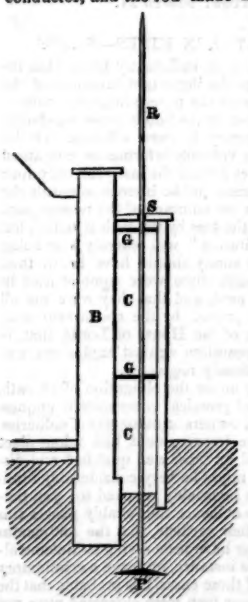
If coroners' inquests are retained as "a part and parcel" of our judicial system, it is impossible for them to receive that respect which it is so essential to the best interests of society should be voluntarily and freely awarded to all the tribunals of our country, unless some beneficial changes are made in its constitution and proceedings, so that they may administer the laws with impartiality and effect to all classes of her Majesty's subjects. How far the suggested alterations—viz.: coroners to be elected by the Crown to have the assistance of the inspectors of mines, and the juries to be taken from the neighbouring towns—would effect such an improvement, is for others to determine; at all events, the subject is of sufficient importance to demand a serious consideration, and, in the absence of other propositions, those herein offered may possibly serve to attract the attention of your able correspondents, and induce them to offer some better and more efficient plan of instituting and conducting coroners' inquests on deaths in mines.—J. RICHARDSON, C.E.: Neath, March 18.

ON THE CONSTRUCTION OF LIGHTNING CONDUCTORS.

The great importance and usefulness of lightning conductors have caused much attention to be given to the best mode of constructing them. They have been generally attached to the buildings they were intended to protect, except in the case of powder magazines, where they are frequently supported by a staff, similar to a flagstaff, and thus kept separate from the magazine. In the year 1828, a committee was appointed by Government to confer with the president and committee of the council of the Royal Society on this subject, with the view of elucidating the most correct manner of erecting them, when the following conclusions were arrived at:—

1. The top of the lightning conductor should, according to Sir H. Davy's opinion, be 3 feet above the highest ridge or summit of the building.—2. When the conductor does not terminate either in water, or in a moist stratum of earth, it should, on entering the ground, diverge from the vertical line at an angle of about 45° to the horizon, and extend to 4 or 5 feet below the level of the foundation of the building it is intended to protect.—3. The top of the lightning conductor should be of copper, tipped with platinum or gilt. The former was suggested by Sir H. Davy, and the latter by some of the members of the committee of the council of the Royal Society; and as gold is a better conductor than platinum, and the difference of expense very trifling, it is to be preferred.—4. The best mode of uniting together the various parts of the conductor is by a dove-tailed scarf joint, with double-riveted pins.

Various alterations have since been made in the construction of these instruments, and some of the changes have not been for the better. Copper has been substituted throughout the whole length for iron, on account of being a better conductor, and the rod made hollow, to prevent the heating of the metal by the descending fluid. Annexed is a sketch of one I have seen of recent erection, with all the latest alterations. R, is the hollow copper conductor; C C, a sort of chimney, or shaft, enclosing it, and attached to the main building B; G G, are squares of glass, about 1/2 inch thick, with holes in the centre, through which the rod, R, passes, with the view of securing its proper insulation from the building; P, is a triangular brass plate, placed on a moist stratum of earth, upon which the rod, R, rests, although this is sometimes done without, the rod resting upon the soil without the plate; S, is a stone covering the top of the shaft, with a hole in the centre, through which the conductor is made to pass. But this expensive kind of conductor appears to be less safe than many of its predecessors, and at the same time the great extra expense may be avoided by other means. The collection of a small portion of rubbish would close the small hole in the stone, S, and be likely to divert the lightning from its course to the brickwork of the chimney and building, especially if the lightning be attended with rain. The upper glass, G, would also form a lodging for dust entering by the hole in S, and as the interior of the shaft would be always damp, the glass would by this means become a conductor, instead of an insulator, and the pyrogen once becoming scattered



there might be no end to the mischief that would result. The rod and shaft becoming thus, as it were, one conductor, the fluid must follow its own nature, and spread itself over the outside, and the portion of the rod in the interior of the shaft would be out of use. As regards the heating properties of pyrogen, I have already shown in my papers on the subject that heat is the result of an insufficient surface for the passage of the fluid, and to remedy any supposed evil in this respect the more expensive metal, copper, need not be employed; for a larger surface of iron will answer the same purpose, as is proved by the well-known fact, that a large block of wood will disperse an electric charge quicker than a fine copper wire, although the wood, size for size, is vastly inferior in conducting power to any metal.

There is another objection to the plan in question; only one point is provided at the top, instead of the old-fashioned fan of points, which seems to be decidedly the safest and best for the purpose, as affording the best means of collecting any sudden discharge from the atmosphere.

The plan represented in the sketch, objectionable as it is, has been recently adopted at some powder magazines, for which it seems to be remarkably unsuitable. For buildings of this kind there can be nothing better than the old method of securing the conductor to a staff, quite separate from the magazine. At the powder magazine at this port, the con-

ductors are attached to the roof and walls; but they are of such dimensions, and so arranged, that there is little probability of an accident; for they form a sort of skeleton frame over the building, and are sunk deep into the earth in wells. Of the necessity for lightning conductors to lofty buildings, there cannot be any doubt, as the damage that occurs to churches for want of them sufficiently proves; and the only wonder is, that they are not in more extensive use. Such a place as London might be totally exempted from the loss in life and property that sometimes occurs, if they were more general. In ships they ought always to be employed, but more especially in vessels carrying gunpowder and other combustibles; for, on the level expanse of the ocean, they are very apt to be struck by lightning; and Sir Snow Harris's adaptation of them to the purpose, scarcely renders the neglect of the precaution excusable.

Since my communication to the *Mining Journal*, about a year since, on fixing a conductor to each post of the electric telegraph, the plan appears to have become general, at least, as far as new lines are concerned—that is, if a piece of wire, projecting about 3 in. above the top of the posts, deserve the name of a lightning conductor. They seem rather to be mere points to draw off the pyrogen from the atmosphere in the immediate neighbourhood of the posts; and, when struck by lightning, they are of such insufficient dimensions, that the fluid seizes on the post, and splits it, instead of passing into the earth by the wire. To be worthy of the appellation of lightning conductors, they ought to be of more substantial dimensions, and approach something towards Sir H. Davy's idea of height—3 ft. above the highest point. With conductors of these dimensions, there would be no more shattered posts and damaged lines from lightning.

The most singular application of the lightning conductor has been for the prevention of earthquakes. At the latter end of the last century the Chevalier Viviani, considering that these calamities resulted from the sudden rupture, by pyrogen, of bad or non-conducting media in the crust of the earth, proposed to fix metal conductors, terminating in a number of points like a brush into the ground, to as great a depth as possible. Another plan has been adopted at Naples, where there is a pyramid before a church, under which is a deep well, with several mouths opening about the base of the pyramid. This, it appears, was sunk, that the water, acting on the principle of the lightning conductor, might pass the fluid from stratum to stratum, and prevent any discharge that might cause an earthquake. Wells and other excavations have also been made for the same purpose in the City of Udine, as well as in Nola, in the kingdom of Naples. I am not aware if they have answered at the other places, but at Nola the success seems to have been most unequivocal, for that city was never known to have been damaged by earthquakes. Artesian wells are admirably adapted for this purpose. JOHN J. LAKE.

Ordnance Office, Portsmouth, March 19.

ON THE TAILS OF COMETS TURNING FROM THE SUN.

SIR,—It has, I believe, been observed, that the tails of comets, when they have been, as always turned from the sun, whether approaching that body, or receding from it. The well-known fact, that the sun extinguishes fires, affords an explanation of this singular phenomenon, on the theory that comets are bodies in a state of combustion; for the operation of the same law that in our planet puts out fires, would produce this very effect, and prevent comets burning, except on the side away from the sun—that is, in their own shadow. JOHN J. LAKE.

Ordnance Office, Portsmouth, March 19.

THE ELECTRIC TELEGRAPH.

SIR,—Allow me space for a few words upon a subject which has most deservedly occupied a very important position in your columns for the last few weeks—I mean the electric telegraph; and I am anxious to correct a doubly false impression, which might be conveyed by a statement in the leading article of Saturday last, that "Messrs. Brett and Little were the first to operate upon two indicators by a single wire."—1. As regards priority, the merit of this invention is, I think, due to Dr. Steinheil, of Munich, who applied it in his telegraph, erected between that city and Bogenhausen, in 1837—for an account of which see the numbers of Mr. Sturgeon's *Annals of Electricity*, April, 1839, referred to in the article of your Journal to which I have alluded; see also Vail's *Electro-Magnetic Telegraph*, Philadelphia, 1845, and Moigno's *Traité de Télégraphie Electrique*, Paris, 1849. The mechanism employed by Messrs. Brett and Little is altogether different from that of Dr. Steinheil's instruments, and undoubtedly far superior; but the principle, of which I am speaking, is common to both—viz.: the operating upon two indicators by a single wire. I am not aware that Dr. Steinheil used the deflected magnets as indicators upon a dial; in one arrangement they were made to strike two bells, of different tone, by means of which conversation was carried on, and, in a printing telegraph, acted as markers—each carrying a reservoir of ink and pens; by means of which communications were written in two lines of variously combined dots upon a continuous strip of paper, as in Bain's or Morse's instruments. Whatever may have been the secondary apparatus, Dr. Steinheil must, in employing two prime movers with a single circuit, have had in view the important object, identical with that of Messrs. Brett and Little—of avoiding the oscillation of the needle, and which takes place after each deflection in instruments where each indicator is capable of assuming either of two deflected positions, according to the direction of the current, as in the instruments in general use in this country; and this brings me to the false notion which might be formed on hearing that Messrs. Brett and Little are able to work two indicators by a single wire. Two indicators are moved, it is true, but each only in one direction; so that the number of conventional signals which can be given is no greater than with a signal needle instrument, upon Messrs. Cooke and Wheatstone's plan. With a double needle instrument, upon the latter principle, eight simple signals may be given by a single movement; by Messrs. Brett and Little's arrangement, though a pair of "indicators" are employed, only two; six letters of Messrs. Brett and Little's alphabet require as many as five distinct movements of the indicators; and eight require as many as four such movements. In Messrs. Cooke and Wheatstone's double needle code, no signal requires more than three movements; its advantage, therefore, in point of speed must be undisputed; two wires are, however, required. Messrs. Brett and Little can do the two indicators with a single wire! so did Steinheil 10 years before the date of their patent. I may mention that the principle of giving motion to two indicators by one wire, has been proposed in two patents subsequent to that of Messrs. Brett and Little.—1. In Mr. W. S. Ward's specification, enrolled March 2d, 1848.—2. In that of Messrs. Highton, enrolled July 25th, 1849. G. E. D.

March 21.

PATENT RIGHT.

SIR,—I had not noticed the proposal in your Journal to which Mr. Campin alludes, but I fully agree that anything more futile, pernicious, and absurd than a substitution of rewards by a Government Commission, in the place of patent right, could hardly be devised, even by the brain of insanity. Accidental connection with a Government places some individuals in this post of arbiters of merit; a tact for deferential flattery, a real or pretended agreement in some private crochets of opinion, a pleasant social manner in turning a jest or telling a story, or a profoundly silent manner of appearing wise, a good notion of horse-flesh, or some such matter, a family connection or acquaintance, a dexterous hand at billiards, a ready assumption of clover sharpness, or of mysterious phrases—all these are some of the most innocent qualifications by which candidates for Government favour please the private prejudices of those who have the chance of dispensing reward, or of bringing their claims into notice. I do not mean to deny that these are all talents in their way, and talent deserves distinction; but if inventors are to be rewarded, it is desirable they should be rewarded as inventors, and not as something else. A man of solid attainments is quite incapable of wasting his time and thoughts on what is necessary to gain the favour, or canvas the votes, of those whom accident shall place in such a commission, and whose habits preclude the possibility of their being able to understand his real merit, except by accident.

There is very frequently a smattering in these establishments, who is like the one-eyed man in the kingdom of the blind—a reputed prodigy; and for the sake of his learned reputation, obstinately decides, and is permitted to decide, everything in his own shallow and one-sided way. To court such a commission is quite a distinct business from benefiting mankind by profound discoveries; it is degrading to such a man to hunt for testimonials of that which, to the understanding mind, is its own testimony. He knows, as a general rule, that matters are prejudged and predetermined upon quite different grounds, before the phantom form of testimonials is invoked; these are merely furnished by the unsuccessful, at their proper cost, to constitute the cloud out of which the real deity may be revealed, and descend, with mythologic dignity, to the astonishment of all beholders. I doubt the millennium of Government Commissions is as yet at least a

thousand years from its commencement. I would rather, as an inventor, stake my chance of reward upon the cast of a die than be at the mercy of such tribunals. The decision would be speedy, involving no useless trouble, and no expectation could be disappointed. Whigs have been defined to be persons with unsettled notions of right and wrong, in which case we can only expect their commissions, for consistency sake, to practice their own principles. See, at the present moment, how an individual Scotchman and a Jew have been able to unlock the secret gate to favour, so that no public cost can exceed their private merits. Contrast these, as an instance, with the unfortunate Baron de Bode, whose claims were never questioned on the score of justice, but solely of technicality.

I presume this premiumizing committee is the idea of some one who wishes a post in it, not having the capacity for anything better. To such an origin these schemes are commonly traced; the present is too absurd to be ever seriously proposed. It would be a considerable rate which, after paying the staff of oracles, and guardians, and patent beads, would leave any surplus for the relief of supplicating paupers, who must first prove their settlement in the parish of invention. Whence, as Mr. Campin correctly asks, is this fund to be raised? Perhaps by post obit bonds on common sense, drawn by "Bumble, the porochial beadle."

March 13.

DAVID MURPHY.

IMPROVEMENTS IN PROPELLING STEAM-VESSELS.

SIR,—Observing, in your Journal of last week, an account of Messrs. Ruthven, of Edinburgh, having applied the fan-wheel for the forcible expulsion of water through tubes for the propelling power of a ship, and having ever noticed that your columns are open for the dissemination of truth, and the prevention of erroneous conclusions, I trust you will allow me a short space to inform your readers, and Messrs. Ruthven, that the same method of propelling by a fan-wheel inside the boat, was patented by Mr. Hales, of Southampton, and experimented on to a great extent some 10 or 12 years ago. It proved a complete failure, as any plan always will, where you depend upon centrifugal force. Its powers were experimentally on at the Soho Works, near Birmingham, and the report published some time since, which proved its total incapacity as a propeller. I have had some experience in the working of steam-boats, and in erecting machinery for numerous different descriptions of propellers, and have made these few observations for the information of our Scotch friends, who may not know what is doing here.—J. T. CARTER: Wellington Foundry, March 13.

THE FLOATING RAILWAY ACROSS THE FORTH.

SIR,—My attention has been accidentally called to a paragraph in your publication of the 2d inst., headed "Floating Railway across the Forth," in which you endeavour to show that Mr. Bouch, manager of the Edinburgh, Perth, and Dundee Railway, is not entitled to claim any merit in carrying out this scheme; but attribute the whole to Mr. Grainger, of Edinburgh. Now, Sir, although I at once confess that I write this as a friend to, but at the same time without the knowledge, of Mr. Bouch, it is not my intention to trouble you or your readers with a long letter, as to who is, and who is not, entitled to lay claim to the invention; but I take the liberty of enclosing herewith a copy of the half-yearly report of the company, just issued to the shareholders, in which you will find that the directors, in noticing the completion of the works, do not even mention Mr. Grainger's name in connection therewith; but justly attribute the merit of the whole apparatus to Mr. Bouch and Mr. Napier, of Glasgow; and I trust that a sense of justice will induce you to give publicity in your next Number to that part of the directors' report alluded to. A SHAREHOLDER.

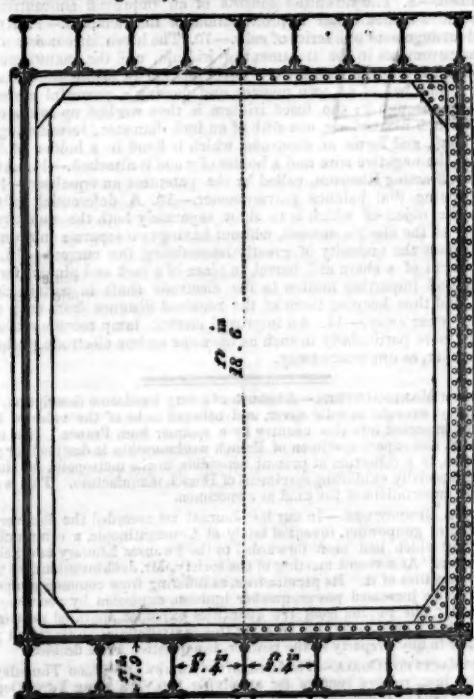
Edinburgh, March 18.

EXTRACT FROM REPORT OF THE EDINBURGH, PERTH, AND DUNDEE RAILWAY.

The directors have the satisfaction of stating, that the plan suggested by Mr. Bouch for conveying the traffic, without breaking bulk, across the Granton Ferry, by means of the large vessel, the *Leviathan*, originally intended for the Tay Ferry, and the machinery invented by that gentleman for the shipment of goods and mineral waggons, has succeeded beyond their most sanguine expectations. All doubt has thus been removed with respect to the practicability of transporting the waggons and trucks across the Forth with facility and regularity. The *Leviathan*, built by Messrs. Napier, of Glasgow, reflects the greatest credit on these eminent builders. She has given complete satisfaction; and, from her capabilities and power, it does not appear that any weather would prevent her carrying the trains across the Forth. The outer breakwater, which is about to be constructed by the noble proprietor of Granton Pier, for protection of the harbour, now in course of formation, will afford full shelter to the company's works in all states of the weather.

TUBULAR BRIDGES.

RESPECTED FRIEND,—I was much interested in the remarks in last week's *Mining Journal* upon the tubular bridges, and also pleased with the engraved sketch of the cross sections of the tube, which certainly exhibits very considerable ingenuity, but I am somewhat amused in observing the



claims made by certain individuals as to who were the originators of the costly plan of tubular bridges. It, however, does appear clear that Robert Stephenson was the first to suggest the idea, but the perfection of it also appears clearly to be mainly due to Wm. Fairbairn; but upon the principle of *ex aequo*, I do not think much merit is due to either, further than exhibiting what may be accomplished by art when there is an unlimited command of capital. Now, had the structure been made with copper, it would have excited still greater admiration, as exhibiting the enormous wealth of the company; but then, methinks, the shareholders of the broad gauge, why R. Stephenson did not adopt the principle of the High Level Bridge, only, instead of using a cast-iron arch, to have composed the whole structure of wrought-iron. This could have been easily done, by suspending a powerful frame from the towers. I have no hesitation in stating that an equally powerful structure might have been erected with less than half the weight of iron, and at less than one-third the cost of the tubes. I believe I may safely claim the merit of being the first to model of which, for a bridge of 500 ft. span, I made in 1827, and exhibited to many of the most eminent engineers and mathematicians of that period, among whom I may mention Barlow, Brunel, Tredgold, Birkbeck, Lardner, &c. The eminent T. Tredgold, after inspecting it, wrote me the following letter, which I have now by me:—

Grove-place, Lisson-grove, July 3, 1830.

SIR,—The suspension of a bridge from curved ribs, which are connected at the foot by straight ties, is not a new method, but it is a most valuable one where the connection of abutments is expensive, and where the curved ribs are of the proper figure and of the proper degree of strength and connection to resist both the constant and occasional

On receipt of this letter, and apprehending that my design (which I formed as arch suspension, and not a girder), I addressed a note to him, requesting to be informed whether he was acquainted with any person conversant with the art of constructing such a bridge with wrought-iron had ever been projected, to which he replied, on the following day, to this effect:—"To your inquiries I reply, that I am not aware that a bridge, or a design of a bridge, has ever been made, with the idea of cutting it in iron, on the principle of your model; but I have no objection to your trying the method, and not doubting that your success is not only probable, but certain." He then refers to his book on carpentry, and to the wooden bridges of Millington and Withington. I received also the following letter from Dr. Birkbeck:—

50, Broad-street, June 28, 1826.

In Liverpool, about the year 1830, at the time I published my plan for self-suspension viaducts (and which Dr. Lardner inserted in his volume *On Iron and Steel*, 1831), I constructed another iron model of the bow and string, or arch suspension, and exhibited it to the directors of the Liverpool and Manchester Railway and the late George Stephenson, who all expressed themselves much pleased with it, particularly G. Stephenson. This model I took to Newcastle-upon-Tyne, and from it constructed a foot bridge for the Newcastle and Carlisle Railway Company on the principle, about 35 feet long and 5 feet wide, which contained about 15 cwt. of iron, and was tested with a load of 10 tons, which it bore with perfect safety. Subsequently I made a large model, on the scale of 1 inch to the foot, for a bridge of 300 feet span, with a roadway on the lower line, and shops on the upper line, and a viaduct (the *Redoubt Viaduct*, as it was called), with a roadway, by superimposition of a *Redoubt* (the *Lord Lowther*), exhibited for many months in one of the rooms in the Strand, previous to the Improvements in that part of Westminster; and a bridge on the principle was projected, with a centre span of 400 feet, and two side spans of 300 feet each, with an opening from Charing-cross to King's Arms Stairs, on the opposite side of the river, with two carriage ways on the lower line, and an arcade of shops on the upper line—thus forming what may be termed a skeleton tunnel (which might possibly have been the means of inducing E. Stephenson to project the tubular bridge); and I humbly think would have been much less costly and much more efficient, with half the quantity of iron, than the celebrated tubular bridge, which, however, will still be more economical plan, might have been adopted—viz., what I term an inflexible suspension bridge, designed and executed 10 years ago at Tynron, near Bath, the

Having stated thus much of the principle by which all bridges are governed, I will proceed to show what amount of iron a bridge on this principle, 1500 feet long—viz.: two spans of 500 ft. each, and two of 260 feet each—would, in my opinion, require, the quantity of material that would sustain an uniform load of 500 tons, with perfect and unerring certainty, and also to state the manner of constructing it. Assuming the large span to be 1500 feet, and the smaller the tower to be 260 feet, and the height of the clearing power to be 480 ft., I should then divide the length into 20 parts, of 24 ft. each, and, having determined the form and dimensions of the beam, I should then provide a strong and powerful platform, on wheels, with powerful cranes, of sufficient dimensions to enable fixing the first division of the beam—viz.: 24 feet—as soon as the masonry of the pier was sufficiently high, to insert three properly proportioned sets of equal dimensions with the four suspending bars; and I should propose three sets of suspenders—namely: one at each side, and one in the middle—unless it was deemed advisable to have two in the middle (I should likewise prefer having two sets of suspenders and beams, so arranged as to have two roadways 15 ft., and a footway, 6 ft. wide, in the middle, making the breadth 36 ft., the flooring to project 3 ft. over the side, so as to make the roadway 30 ft. wide, and the footway 6 ft. wide), and increase its suspending power to nearly 16,000 tons; these bars to be attached to the saddle-bars, and these fixed on the transverse bolt at the end of 24 feet. I should thus have 6 bars, 4 by 1 in., to support that portion of the bridge, which, assuming each sectional inch to be equal to 25 tons, would produce a power to the breaking point of 150 tons; but, as the length is four times greater than the height at the tower, a unit of weight would be multiplied by four, and would do no more than double the force, or 48 tons; or, if the load is doubled, it would be 96 tons, or less than one-sixth of its actual sustaining power. When these are properly fixed, I would lay on the joists and floorings, and then propel the platform with the hanging scaffold on to that portion of the floor; and, when the tower is 6 ft. higher, proceed in fixing saddle-bars, &c., as before mentioned, until the 16 sets of bars and 10 divisions of the beam are complete, and the machine, like a runner, has moved up the tower, and is now in the middle.

"I have a nice timbered span, 14 ft. over the water, and I should like to suspend the main spans, as you have here, and I should propose upright supporting bars, and, in order to increase the stiffness of the beams, I should add suspension bars under each division of 24 ft. Now, the proportions I have stated would give a suspending power to the breaking point of about 12,000 tons to each of the main spans; and, assuming the weight of each main span, including iron, timber, and railway, to be about 100 tons, this would cause a strain equal to *nearly its own weight*, or 1000 tons; and a load of 1000 tons would be equal to *nearly twice its own weight*, or 2000 tons; and a load of 2000 tons would be equal to *nearly three times its own weight*, or 3000 tons;—making, together, 3000 tons; about one-sixth of its actual capacity. Each division of 24 ft., including the upright, supporting, and saddle-bars, would require about 18,000 ft. of bar-iron, 4 in. by 1 in., which at, say (to be safe) 14 lbs. to the foot, would be 25200 cwt., or about 112 tons. The three beams, containing a section of an average of 12 square inches, say, 2½ cwt. to the foot run, would be about 60 tons; 30 transverse connecting bars, 1½ in. diameter, 10 ft. long, would be about 15 tons; 30 transverse plates, and contingencies, 15 tons—making, altogether, for one span of 500 ft. under 300 tons, or less than 600 tons for the whole structure! Now, astounding as this may seem, yet the surprise will be diminished when it is considered that the Twerton Bridge alluded to, of about 40 ft. long, 14 ft. wide, had only about 3 tons weight of suspending and supporting parts, whereas I have here computed the suspending bars at upwards of 100 tons for a span of 500 ft. long, and 14 ft. wide. I have also shown the necessity of the main spans, which was objected to by the Admiralty, I should have recommended a bridge, composed with an arch and triangular framing entirely of wrought-iron, similar to my design for a bridge at Clifton—an engraving and description of which appeared in your Journal, May 22, 1847; a model of the principle of which I am now making, representing a segment for a bridge of 140 ft. span, on the scale of 1½ in. to the foot; which I hope to get finished in a few days, and send to you, and to the Admiralty, for their examination. I will give it to your office for the inspection of those who may feel desirous of seeing, and will furnish for your next publication a full description thereof, together with some engravings of the Twerton-bridge.—THOMAS MOYLEY: *Silangate, Lambeth, 3 mo., 21.*

IMPROVED COVERING FOR RAILWAY WAGGONS.—A simple, but most efficient; mode of covering railway trucks, waggons, &c., for the conveyance of goods and merchandise, in lieu of the clumsy and unscientific manner in which this operation has hitherto been performed by the old, heavy, cumbersome, and loose tarpaulin, have been patented by Mr. Rowland Brotherhood, of Chippenham. On taking a glance of the various appliances and paraphernalia of the merchandise truck department of a railway station, the variety of detail, and the numerical extent of these necessary miscellanea, are at once apparent; and among these, perhaps, there is no chattel of general use subject to so much wear and tear, both from legitimate use, or from culpable neglect, as the tarpaulin truck covers. Made of an intractable material, and most troublesome to fold and unfold, they get set in particular lines and angles, and, continually suffering from the motion, get worn into holes and cracks, requiring continual repairs; and there placement of those entirely worn out, becomes a heavy item in the traffic expenses. Mr. Brotherhood's patent tilt will be found most admirably to supersede this clumsy affair; it allows of a small or large portion, of the whole area of the truck, to be exposed; one porter can uncover two trucks in the space of a minute, and two can re-cover them in the same time. It consists of a fan of seven ribs, placed at each end of the truck, connected in pairs by a horizontal bar to each over the top of the truck; this fan is covered with prepared water-proof canvas, and is opened and enclosed with as much facility as the head of a cabriolet, or landau, on which principle it is constructed. It affords great facility for loading and unloading goods; can be secured by locks and keys—thus protecting goods on transit; and from the simplicity of construction, and its lasting nature, we may suppose that, from its low price in construction, and the reduction in wear and tear, it will be found highly economical substitute for the old method. It has been in use all the winter on the Great Western line with much satisfaction; and many scientific writers connected with railway transit, who have witnessed the new mode of covering, have expressed their unqualified approbation of the plan, and opinions that it will prove of great advantage to railway companies.

EAST INDIAN RAILWAYS.—Amongst the passengers for India by the steamer the 20th inst., was Mr. George Turnbull, the resident engineer of the East Indian Railway Company, and his staff. A vigorous prosecution of the works now looked for. From the recent reports of the company it appears that more than 800,000*l.* of the capital is already paid-up, upon which the guaranteed interest of 5 per cent. is accruing, and that arrangements have been made with the India-house, by which, at the expiration of the current year, the paid-capital will amount to about 500,000*l.*, or one-half of the million required for the first section of the line.

follow out its directions; he immediately discovered that the invention said

We cannot close our remarks, however, without recurring to some of the objections we have already alluded to: the chief of which is, we may say, the absurd custom of granting letters patent, *as a matter of course*—Letters patent, according to law, are nothing more than grants by the grace and favour of the Crown, thus showing that the subject has no legal right whatever to a patent, and for the very good reason, that the law views all such exclusive privileges with extreme jealousy, as tending, if not especially guarded, to grow into a monopoly, which is illegal, or, as Lord Coke expresses it, “abhorrent to the law of England;” and yet, notwithstanding, a grant, that is no more than a “favour,” and the very principle of which is so obnoxious, is obtained in the following extraordinary manner—*A declares that he has invented something, and applies for a patent*—that is, to have this something made over to him as his own exclusive pro-

erty. Now, here four important questions naturally suggest themselves.—1. Is his declaration *true*?—2. Has he *invented* something?—3. Admitting that he has, is the invention likely to be *useful*?—and 4. If *so*, then is it sufficiently so to entitle him to letters patent for *fourteen years*? Not one of these questions are even asked of any one save the applicant himself; if they were, no one can doubt but that the result would be that hundreds of letters patent would not be issued. The next step is this: having made his declaration, A then petitions her Majesty to grant him letters patent, which petition her Majesty, in these words, refers “to Mr. Attorney-General, to CONSIDER THEREOF, and report HIS OPINION thereon what may be PROPERLY done therein”—to which most proper and distinct inquiries, the Attorney-General reports to her Majesty as follows:—That in support of the allegations contained in the said petition, a *declaration of the said petitioner* hath been laid before me, *VERIFYING* the truth of the said petition;” when, in point of fact, Mr. Attorney-General reports not only has neglected to “consider thereof,” to enable him to obey her Majesty’s commands—viz., “to report *his opinion* what may be PROPERLY done therein”—but actually informs her Majesty that *the declaration of the said petitioner verifies the truth of his petition!* The report then goes on to say—“*Upon consideration whereof* (?) and as it is *entirely at the hazard of the said petitioner* whether the said invention is new, or will have the desired success, and as it may be reasonable for your Majesty to encourage the arts and inventions which *MAY BE* for the public good,” Mr. Attorney-General recommends the issuing of letters patent, which, to complete the mischief, are issued accordingly. Here we are told by the Attorney-General that “it is entirely at the hazard of the said petitioner, whether the said invention is new, or will have the desired success.” We, on the contrary, consider that by such a course of proceeding as that which we are now exposing, there is every reason to apprehend that the trade and commerce of the country will be seriously injured and with heavy

the country cannot fail to be most injuriously interfered with by such rash and senseless trammellings and restrictions; and, consequently, the "hazard" to the public, caused by the practice of distributing patents, broadened as it were, over their just and lawful pursuits, is infinitely greater than the "hazard," of which the Attorney-General speaks, but of which he knows nothing whatever, is to the petitioner. In our opinion, every patent is a "hazard" the improvement of the particular branch of business to which it belongs. The patentee does not desire to extend it, because he has already a patent—the public cannot, for fear of invading the rights of the patentee, and of incurring the easy but costly remedy of a lawsuit! But there is no other person that incurs a "hazard" in obtaining letters patent. We think there is, and that this person is no other than Mr. Attorney-General himself. We have shown the extraordinary mode by which A has obtained his patent; we will now suppose that it is declared to be null and void by the remedy of a lawsuit; in other words, that the speculation A turns out to be a failure. What is the "remedy" the public has obtained by this verdict? We reply—The injury to their trade—the cost of the lawsuit—the loss of time, equivalent to a loss of money, which it would be difficult to estimate—and the privilege of continuing their lawful business, which has been unlawfully, by the carelessness and neglect of Mr. Attorney-General, interrupted, if not destroyed. If, therefore, these serious injuries have been occasioned by the bad advice, or through the neglect, of the Attorney-General, as the adviser of the Crown, the party injured is unquestionably a right to compensation, in damages, for the loss he has sustained; and, in support of this assertion, we quote the words of Sir Edward Coke. "Every subject for injury done to him, in bonis, in terris, in personis, by any other subject, be he ecclesiastical or temporal, without ANY EXCEPTION, may take his remedy by the course of law, and have justice and right for the injury done to him—freely without sale, fully without any denial, and speedily without delay." The simple question, then, is, has Mr. Attorney given bad advice?—has he neglected any preparation he might have taken to prevent the injury committed?—or has he, in fact, obeyed the commands of her Majesty? We repeat the words used by his Sovereign, which are these:—"TO CONSIDER thereof, and report his opinion what may be PROPERLY done therein." And what do these words and distinct commands refer to? To the Act of Parliament of the 1st James I., cap. 3, which limits the granting of letters patent to such inventions as "be not contrary to the law, nor mischievous to the State, by abusing the prices of commodities at home, or hurt of trade, or generally inconvenient," all of which the Attorney-General is, consequently, to consider and report upon. It is, therefore, abundantly clear that, if the Attorney-General did not consider thereof, and report his opinion what may be properly done therein, he has neglected to comply with the instructions of his Sovereign, and has thereby injured some person; as it is equally clear that, since not even can the Crown, as a matter of course, grant letters patent, but only in certain cases, and under certain restrictions, it would be utterly wasting our time to offer a word more than merely to assert that no such authority can be exercised by the Attorney-General, without rendering him liable to an impeachment, for the improper exercise of the functions of his office. In saying this, we need scarcely observe that we do not on reflection upon the honourable and talented individual who now occupies this situation; we are merely stating what, in our opinion, is the law on this subject, fully satisfied that all the abuses we have complained of are crept into practice, like many others, from various causes, which it would be useless to inquire into, and that those against which we are re-animating have no foundation, in fact, in the desire of any one to condemn them, when their existence is fully proved.

We have traced the progress of a patent to the report of Mr. Attorney-General. We now proceed to the last act of the play, the conclusion of which in perfect keeping with its commencement. After the report has been presented, as it is supposed, to Her Majesty, a warrant is issued, containing the following words:—"We being willing to give encouragement to all inventions, which may be for the public good, are graciously pleased to conced to the petitioner's request. Our will and pleasure, therefore, is, that you prepare a bill, &c.," with, however, the following proviso, which is accordingly inserted in the letters patent:—"Provided that the petitioner does, within — calendar months, to be computed from the date of our said intended grant, cause a particular description of the nature of his said invention, and in what manner the same is to be performed, to be written under his hand and seal, to be enrolled in our High Court of Chancery, otherwise our said intended letters patent to be void."

Now, any person of common sense would naturally expect that, so important a condition as the SPECIFICATION—that is, the means by which the invented invention, at the expiration of the patent, may be understood and practised by the public—should be, beyond all doubt, clear, and satisfactory; and of which, ANY specification the patentee chooses to give, is enrolled, the correctness of it—the very return the public is to receive for the privilege conferred—is thus supposed to be verified (in the opinion of Mr. Attorney-General, and of him alone) by the specification itself, in like manner as the original declaration is said to be verified by the mere statement of one and, in both cases, the same individual! And to show that we are not alluding only to what may be, we are enabled to state the following case which has just occurred, and which, if necessary, we can substantiate. A person recently took up a specification, and proceeded to

Surely such inconsistencies as those we have now described cannot be defended, or suffered to remain any longer in direct contradiction, as they certainly are, to reason and common sense; for, in laying down rules for the construction of Acts of Parliament, Judge Blackstone says, "that if there arise out of them, collaterally, any absurd consequences, manifestly contradictory to common reason, they are, with regard to those collateral consequences, void;" and two grosser absurdities we cannot imagine, than that a man's own "declaration" verifies itself, and that a "specification" of the manner by which an invention is to be executed, should likewise be received as verifying itself, *without the slightest proof of the correctness, or truth, of either the one or the other!*

But, after all that we have advanced, it may, perhaps, be said by some persons, that the present *practice* is better than the *theory* of the law in the case of patents—that it is better to have to cure a disease, than to take proper measures to avoid it. The rights and liberties of Englishmen, however, are, and ever have been considered, as best secured to us by the very reverse of this advice, for many of our most important laws are *negative*, of which, for the protection and lawful prosecution of our trade and commerce, the Act of James I. constitutes the chief one for this object. But, if the *practice* must be continued, the law must be altered in conformity with it—if any one can be found ready to support the proposition, that the trade and commerce of the country may be *interfered with or not*, by simply obtaining the fiat of an *Attorney-General*!

We now conclude with offering some suggestions for the better adaptation of our patent law to the altered state of things, with regard to our trade and commerce, as compared with those which existed in the time of James I.—that is, more than two centuries ago. The first step, however, should be to obtain the information we proposed in our paper of the 16th Feb.—viz., the number of patents at present existing; the object of them under general heads; the number at present in *operation*; the date of the first written specification. We then propose, three small boards of commissioners, each composed of three competent persons, one board to have the power to advise the Crown to issue letters patent for *chemical discoveries*, one for *mechanical inventions*, and one board composed of men of science, to determine the length of time for which every patent should be granted, according to the merit of the inventor, and the advantage his improvement would be likely to confer upon the public. Then, that disputes respecting patents should be submitted to three arbitrators, chosen by the disputants themselves, or else appointed by the Attorney-General, in case of the refusal of either of them, and these arbitrators empowered to judge and decide without appeal. We are fully aware that objections may be raised to every proposal, as well as that *not one* can be adopted that shall not have some disadvantage; but after taking an impartial view of the now *necessary* expense, and the uncertainty of appealing to the courts of law, where the subject matter is alike little understood by the judges, jury, and counsel, we are of opinion that some such plan as that now proposed would be far preferable, both for the interest of the suitors themselves, and also for the party whose interests ought to be *paramount*—viz., the public.

Although numerous have been the attempts to produce a charcoal from peat fit for all, even the most delicate metallurgical purposes, and although several patents have been obtained within the past few years for particular methods of manipulation, success has not yet appeared to have crowned our efforts in this country. While these attempts have been made in vain in England and Ireland during the past 10 years, Mr. Vignoles, the well-known railway engineer, during his professional duties on the continent, discovered that a process for converting peat into charcoal or coke, had been most successfully carried out in Germany for some years past. He accordingly availed himself of the opportunity, and having made himself master of all the details of the process, has taken out a patent for Ireland, from the specification of which we extract the following particulars:—The peat is subjected to a certain high temperature, in such manner as to deprive it of the whole, or the principal portion, of the water which it naturally contains. This heat is then continued under peculiar circumstances until the peat is converted into charcoal or coke. One of the most important properties of the process is, that by the mode adopted of applying the heat the substance is not burned to ashes and wasted. In the first part of the process, the peat or turf extracted from the bog by any of the usual methods, is dried in pieces of any convenient size, either by exposure to sun and air, or to artificial heat, and afterwards placed in an iron vessel of large capacity, called the "carbonising vessel." Steam, generated in any form of boiler, with a pressure of from 45 lbs. to 60 lbs. per square inch or upwards above the atmospheric pressure, is passed through a number of tubes of iron, heated to a bright red heat, by being placed in a suitable furnace, so that without losing its pressure, it acquires additional temperature up to 450° or 460° Fahr., or about the melting point of tin or lead. This part of the apparatus is called the "coil," the surface of which should be nicely proportioned to the generating power of the boiler. The steam thus highly heated is permitted to pass into the "carbonising vessel" containing the partially dried peat, and the effect is rapidly to withdraw any moisture which may remain, in the state of steam, from the peat; the whole of the steam from this vessel is allowed to escape, and may be advantageously used as a motive-power, for preparatory decarbonisation of the turf, or for any other purpose. After this drying process has gone on until the peat or turf has parted with nearly all its moisture, it begins to be charred or carbonised by the high-pressure steam, and in proportion as the dehydration of the peat advances, so does the temperature of the carbonising vessel increase, until it approaches closely to that of the steam in the coil, which must be sufficiently high for the perfect decarbonisation of the peat. The process is continued until the turf is found reduced to a black substance, retaining the forms nearly of the original masses, but now almost a perfect vegetable charcoal or coke.

A deputation from the Oxford, Worcester, and Wolverhampton Railway, consisting of Mr. Ruford, M.P. (chairman), and Messrs. William Mathews, J. B. Thorneycroft, and M. Grazebrook (directors), Mr. C. Bedford (solicitor), and Mr. N. T. Smith (secretary), had an interview with the Commissioners of Railways, at their office in the Board of Trade, on Thursday.

THE NEW VICTORIA DOCKS.—On Tuesday last, pursuant to adjournment, Mr. Rendel, on behalf of the Admiralty, attended at the King's Arms Hotel, Palace-yard, when the promoters of the bill for constructing these docks in the Essex Marshes, opposite Woolwich, with surveys, plans, and estimates, appeared for examination. The bill was unopposed, and Mr. Parsons, of the firm of Burchell and Parsons, Parliament-street, and Mr. Bidder, engineer, Great George-street, appeared for the company. The latter was examined at great length, and explained all the plans and drawings; the cost of the docks was estimated at 400,000*l.*, and, with warehouses, 1,500,000. Mr. Parsons said, the docks would be unequalled in extent, and would be a great public benefit, preventing the colliers and foreign steamers from crowding the Pool, and obstructing the navigation, as they now did; and it was anticipated that the adoption of free-trade principles would cause a vast increase in the number of foreign vessels. Mr. Elmes, architect, and Capt. C. Rowland, harbour-master, both bore testimony to the requirement of the docks; that they would not interfere with the economy of the tide, but would greatly relieve the river. They considered that, if there were double the number of docks, they would give barely sufficient accommodation. Mr. Rendel said, he would shortly make his report, and render it as brief as possible.

EMIGRATION TO THE BRITISH COLONIES AND UNITED STATES.—We noticed our last Number the formation of a company for the encouragement of emigration and colonization, under the title of the "Universal Emigration and Colonization Company," and as the season is now arrived, when all those who intend seeking a home in other climes, where there is more room for the development of their energies and facilities than among our crowded population at home, will be on the point of deciding as to their destination, we would again call attention to the great objects of this company, that of establishing a comprehensive system of emigration on rational and sound principles, which, while benefitting the mother country, will secure to the emigrant every comfort and safety on the voyage, and a clear title to their land when they arrive in the colony, with every advice and assistance until they are settled upon it. Arrangements have already been made for large tracts of land in Canada and the United States, and the company's agents are in a position to treat with emigrants.

